NUTRITION SOCIETY OF INDIA

Twentyfifth Annual Meeting

SCIENTIFIC PROGRAMME
AND
ABSTRACTS

December 18-19, 1992

NATIONAL INSTITUTE OF NUTRITION
HYDERABAD-500 007
INDIA

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02485
NUT-100
N92

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NODINI REDDY, M.D., D.C.H., FIAP., FAMS.
RECTOR

18th December 1992

Dear Delegate,

We are happy to host the **Twentyfifth Annual Meeting of the Nutrition Society of India** at the National Institute of Nutrition, Hyderabad. It gives me great pleasure to extend you a warm welcome.

NIN will be celebrating its Platinum Jubilee during the year 1993. It is our pleasure to have you with us, on the threshold of this historic occasion.

The annual meetings provide an opportunity for the members not only to keep abreast with the latest developments in the field of Nutrition, but also facilitate interaction among the members of the Society.

The programme consists of Orations, Symposia, Award Sessions, Free Communications as well as Poster Sessions. The Organising Committee has taken particular care to cover both basic and applied aspects of Nutrition during the two day scientific deliberations.

I look forward to your active participation in the meeting.

Vinodini

(Vinodini Reddy)
Chairperson
Local Organising Committee

ACKNOWLEDGEMENTS

The President and the Members of the Executive Committee of the **NUTRITION SOCIETY OF INDIA** gratefully acknowledge the financial help given by the following:

United Nations Children's Fund, New Delhi

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Gulbarga Chapter	:	Smt. Sheela Sidharam Reader & Head Dept. of Nutrition Smt. Veeramma Gangosiri Mahila Mahavidyalaya Gulbarga - 585 102

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P R O G R A M M E

18th December 1992

08.30 a.m. - 09.30 a.m. - *REGISTRATION*

09.30 a.m. - 10.30 a.m. - *INAUGURATION*

10.30 a.m. - 11.00 a.m. - *T E A*

11.00 a.m. - 01.20 p.m. -

Young Scientsits Awards Session - I :

Community Nutrition - Junior Awards

Chairperson : Dr. Vinodini Reddy

Community Nutrition - Senior Awards

Chairperson : Dr. Shanti Ghosh

01.20 p.m. - 04.00 p.m. -

Symposium-I : ***Development Programmes for Women and Children and their Impact on Nutrition***

Chairpersons : Dr. K. N. Agarwal
Dr. Bhavani Belavady

Rapporteur : Dr. V. Jagadeesan

Importance of Nutrition Education As A Component in Developmental Programmes for Women and Children

- *Dr. Rajammal P. Devadas*

Nutrition and Agriculture

- *Dr. K. Chittemma Rao*

ICDS : Performance Evaluation - A Four State Study

- *Dr. K. V. Rameshwar Sarma*

Development and Women's Health - Some Key Issues

- *Dr. C. R. Soman*

04.00 p.m. - 05.30 p.m.
(Simultaneous Sessions)

Free Communication Session - I :

Community Nutrition
(Assembly Hall)

Chairpersons : Dr. P. V. Sukhatme
Dr. Kamala Krishnaswamy

Clinical Nutrition / Other Categories
(Conference Hall)

Chairpersons : Dr. Tara Gopaldas
Dr. P. Geervani

Poster Session - I :

Experimental Nutrition/Community Nutrition

EXECUTIVE COMMITTEE MEETING

05.00 a.m. - *T E A*

06.00 p.m.

Sixteenth Gopalan Oration

Speaker : Dr. Michael C. Latham
Chairperson : Dr. K. T. Achaya

07.30 p.m. - *D I N N E R*

** Executive Committee Members and Conveners of the Local Chapters **

Venue : Director's Office, National Institute of Nutrition, Hyderabad.

19th December 1992

08.30 a.m. - 09.15 a.m.

GENERAL BODY MEETING

09.15 a.m. - 10.00 a.m.

Srikantia Memorial Lecture

Speaker : Dr. B. S. Narasinga Rao
Chairperson : Dr. S. Varadarajan

10.00 a.m. - 10.30 a.m. - *T E A*

10.30 a.m. - 11.00 a.m.
(Simultaneous Sessions)

Free Communication Session - II

Community Nutrition
(Assembly Hall)

Chairperson : Dr. Usha Chandrasekhar

Experimental Nutrition / Food Safety
(Conference Hall)

Chairperson : Dr. Sheela Sidharam

Poster Session - II :

Community Nutrition / Clinical Nutrition
Food Safety / Other Categories

11.10 a.m. - 01.00 p.m.

Young Scientists' Awards Session - II :

Experimental Nutrition - Junior Awards

Chairperson : Dr. S. Gnanasundaram

Experimental Nutrition - Senior Awards

Chairperson : Dr. Meenakshi N. Mehta

01.00 p.m. - 02.00 p.m. - *L U N C H*

02.00 p.m. - 04.00 p.m.

Symposium-II: ***Newer Methodologies in Nutrition Research***

Chairpersons : Dr. P. Siva Reddy
Dr. M. S. Bamji

Rapporteur : Dr. T. C. Raghuram

Nutrition Communication : The Indian Challenge
- *Dr. Narender K. Sehgal*

Nutrient Analysis
- *Dr. Y. G. Deosthale*

Bioavailability of Microelements with Special reference to Iron
- *Dr. Subadra Seshadri*

Biochemical Methods for Assessment of Nutritional Status
- *Dr. N. Raghuramulu*

04.00 p.m. - *Concluding Session*

04.30 p.m. - *T E A*

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PRESIDENTIAL ADDRESS

PRESIDENTIAL ADDRESS

DR.K.T.ACHAYA

Dr. Gopalan, Members of the Nutrition Society of India, Fellow Scientists, and Friends.

The 25th Annual meeting brings us again to Hyderabad and the National Institute of Nutrition, where the Nutrition Society of India was brought into being by its Founder President, Dr.C.Gopalan, a quarter century ago. It is only fitting and proper that we commence by paying tribute to him, and to the Institute, for the high technical level that the Society meetings have always maintained, and the excellent planning and arrangements every time we meet here. In practice the burden of running the Society falls almost entirely on the office bearers resident in Hyderabad, who now comprise Dr. Mahatab Bamji - Vice-President, Dr. Ramesh Bhat - the Joint Secretary, Dr. Vijayaraghavan - Treasurer and above all Dr. Vinodini Reddy, who as Director of the Institute is an ex-officio member of the Executive Committee. We owe them a debt of gratitude for their efforts.

The Society has traversed a quarter century, and the future lies ahead. What has the past to show ? One guage would be the Symposia which are featured regularly at every Annual Meeting. Looking over the titles of these three broad types may be discerned. Some symposia have been essentially of specialist orientaion, like those on Trace element nutrition, Lipids and nutrition, Iodine in human

nutrition and New methods of biochemical assessment of nutritional status, to mention just a few. The second category have been symposia on what may be termed interface subjects with a public health orientation, exemplified by such topics as Nutrition and fertility of women, Nutritional anaemia in India and its prevention, Diarrhoeal diseases and their management and Nutrition in urban slums. Then there has been the third kind, with a bias towards national development and planning, such as the symposia on National nutritional policy, achieving nutritional targets (during the Fifth Plan), and Nutrition education for national development. It is clear that a balance has been kept between new scientific knowledge on the one hand, and its application to practical ends on the other. Academism for its own sake would hardly have been compatible with a subject like nutrition which has so many dimensions to it. Such a balance in choice of symposia should serve the Nutrition Society well even in the future, whatever the actual subjects chosen. Thus the alarming problems of the consequences of improper nutrition among the affluent, hardly perceptible two decades ago, call for attention. At all levels of Society, the baneful effects of water pollution, of ubiquitous pesticide residues and of toxins in food materials are matters of concern for nutritionists. The goal of Health for All, whatever its time frame, has a strong nutritional component, and the Society is the obvious forum for discussion and debate. Providing such a platform

is certainly a major function of a scientific society.

There are certain other matters which it seems relevant to raise. There can be no dissent on the need for continuous nutrition education of the public, who have now to find their way through masses of information, sometimes sensational and often contradictory. The question is whether a collective body like the Nutrition Society of India should venture opinions in areas of its concern. A related question is in regard to matters of policy, like say the fortification of salt with iron, or the fluoridation of drinking water, the incorporation of vitamin A into hydrogenated fat. Last year I had said that there is much to be said for a professional body per se steering clear of the passions of the moment, or of a few dominant voices which carry the day. I think the argument goes further. By the very fact of their profession, and as a matter of course, scientists are expected to be questioning and critical. The expression of opinion by an individual with special expertise is obviously of special educative value. These same scientists will also be required to participate in the work of expert review committees or regulating bodies which are constituted to arrive at a consensus or plan of action, and this is also only proper. But to expect a large professional society of heterogeneous membership to proclaim a consensus on any issue is next to impossible, since there is bound to be every shade of opinion. The Nutrition

18th December 1992

Venue : OPEN AIR THEATRE

Time : 06.00 p.m. - 07.00 p.m.

Sixteenth Gopalan Oration : **ANAEMIA AND ANOREXIA, HELMINTHS AND HEALTH**

Speaker : Dr. Michael C. Latham

Chairperson: Dr. K.T. Achaya

ANAEMIA AND ANOREXIA, HELMINTHS AND HEALTH

MICHAEL C.LATHAM
Professor and Director
Program in International Nutrition
Cornell University
New York 14853, USA

In the world today the most prevalent micronutrient deficiency is that of iron, and the most prevalent infections are due to intestinal helminths. Recent research in Kenya and elsewhere has shed new light on the relationships between iron intakes, child growth and appetite, and also between certain parasitic infections child growth, physical fitness and appetite. In turn, some intestinal helminths are important causes of iron loss and anaemia. Ferrous sulphate provided to children resulted in significant improvements in anthropometry and in appetite when compared with controls. School age children receiving albendazole, a broad spectrum anithelminthic, also showed faster growth, better physical fitness and improved appetite when compared with a placebo group. Interventions to reduce anaemia and to control helminthic infections are likely to have benefits in terms of improved health, better child growth and development and greater productivity.

19th December 1992

Venue : ASSEMBLY HALL

Time : 09.15 a.m. - 10.00 a.m.

Fourth Srikantia Memorial Lecture : **CURRENT CONCEPTS IN HUMAN NUTRIENT REQUIREMENTS AND ALLOWANCES, A CRITIQUE OF THEIR USE IN PRACTICE AND A NEED FOR AN ALTERNATE MODEL**

Speaker : Dr. B.S. Narasinga Rao

Chairperson: Dr. S. Varadarajan

CURRENT CONCEPTS IN HUMAN NUTRIENT REQUIREMENTS AND ALLOWANCES, A CRITIQUE OF THEIR USE IN PRACTICE AND A NEED FOR AN ALTERNATE MODEL

B.S.NARASINGA RAO

Former Director
National Institute of Nutrition
Hyderabad-500 007

The current concepts of human nutrient requirements and recommended intakes, presume that the individual is healthy, well nourished with adequate body stores of the nutrients, lives in a good environment without infective morbidity and has access to good quality adequate food. The requirement of nutrients is primarily related to the minimal intakes to replace their metabolic losses with a provision for additional intakes for growth and development of infants and children and to meet the extra demands of pregnancy and lactation. The nutrient requirements and intakes currently prescribed are in terms of a constant daily intake of nutrients from a well balanced diet. The current recommended dietary intakes (RDI) are perhaps particularly relevant to the life styles of affluent societies of the developed countries of the West. Difficulties often encountered in the interpretation and application of the current RDI both at the individual and community level will be examined.

The same concepts of RDI are also adopted for use in the developing countries with necessary adjustments for the lower bioavailability of nutrients from their habitual diets. There appears to be a mismatch between the current concepts of RDI and the prevailing nutrition situation and

food habits in these countries. A majority of population in the developing countries like India are undernourished or only marginally adequately nourished with very low body stores of the nutrients. They live in a poor environment and are constantly exposed to the risk of infective morbidity. Nutrient intakes of such a population should not only cover their basic requirements as conceived under the current recommendations but should also be able to correct the existing deficiencies to normalise their nutritional status. Their nutrient requirements are modified by their state of chronic undernutrition, low body weights and prevailing high infective morbidity. The former reduces requirements due to adaptive process while the latter increases requirement due to nutrient losses. This population which is predominently rural and often poor has also a poor access to sources of food which is quite variable from day to day and from one season to the other. This dichotomy between the current concepts of nutrient requirements and the realities of ground situation amongst the population of the developing countries will be critically examined in the light of the available data on the subject.

Alternate model of nutrient requirements particularly suited to such population will be proposed and its relevance to the estimation of nutrient adequacy to nutrition intervention programmes, and to the planning of food production and distribution will be examined.

18th December 1992

Venue : ASSEMBLY HALL

Time : 02.00 p.m. - 04.00 p.m.

Symposium - I : DEVELOPMENT PROGRAMMES FOR WOMEN AND CHILDREN AND THEIR IMPACT ON NUTRITION

Chairpersons : Dr. Bhavani Belavady
Dr. G. Subbulakshmi

Rapporteur : Dr. V. Jagadeesan

Speakers : Dr. Rajammal P. Devadas
Dr. K. Chittemma Rao
Dr. K.V.R. Rameshwar Sarma
Dr. C.R. Soman

Sponsored by UNICEF & Ministry of Food

SYMP.I
1.1

IMPORTANCE OF NUTRITION EDUCATION AS A COMPONENT IN DEVELOPMENTAL PROGRAMMES FOR WOMEN AND CHILDREN

RAJAMMAL P.DEVADAS
Vice Chancellor
Avinashilingam Institute for Home Science
and Higher Eduation for Women (Deemed University)
Coimbatore-641 043

High infant mortality rate, high levels of morbidity, high incidence of malnutrition and nutrition related diseases, temporary or irreversible disabilities and low literacy rates are some of the major problems of women and children in India. The Government of India has formulated several comprehensive schemes drawing on the resources of the centre, states and voluntary organisations and the community itself towards the improvement of the nutritional status of the population.

The well known scheme namely ICDS covers the children below six years and the expectant and nursing mothers. It provides the packages of early childhood services such as the supplementary nutrition, immunisation, health checkup, nutrition and health eduation to the mothers and non-formal preschool eduation. There have been many independent studies conducted by the Government authorities, NIPCCD, AIIMS, Universities and Colleges which indicate that with the ICDS services there has been considerable decline in the prevalence of malnutrition in terms of mortality rate, acceptance of family planning, school enrolment, immunization coverage, better prenatal and postnatal care.

The nutrition and health knowledge of the mothers participating in the programme is greatly improved.

Apart from the ICDS, supplementary feeding programmes in the schools constitute one of the most promising and effective short term measures to overcome malnutrition among children. Several types of school feeding programmes are in opration in the country. The evaluation studies have indicated that through participation in this programme, the nutrition knowledge of the children as well as their mothers increased.

SYMP.I
1.2

NUTRITION AND AGRICULTURE

K.CHITTEMMA RAO
Dean, Faculty of Home Science
A.P. Agricultural University
Hyderabad

Agroclimatic conditions, cropping patterns, farming systems play vital role on food availability to the population living in that region. However, increase in food production does not ensure increase in food consumption. An attempt was made to assess the nutritional status of families living in rice and sorghum growing areas in Andhra Pradesh. Food and nutrient intakes of families living in rice and sorghum growing areas varied. Nutritional status of Pre-school children in rainfed areas in general, was lower than those in irrigated areas. Dairying showed a positive impact on the consumption of milk and milk products. Landholding of the families demonstrated significant influence on food and nutrient intakes.

Grains are processed in different ways for different end uses. Equal attention must also be given to ascertain the specific characteristics in a product in respect of which the grain is acceptable. Grain acceptability is assessed by visual testing for size, colour, amount of foreign matter, mold contamination etc. Visual assessment plays a role in pricing the grains. The cryptic characteristics like weight, hardness, density, swelling capacity, yield, keeping quality and texture of cooked products are assessed. Generally cryptic characteristics are associated well with overall palatability.

Proteins, amylose content, limiting amino acids were analysed in different varieties of food grains and they were found to vary. Milling quality, physico-chemical characteristics, cooking quality and consumer acceptance of different varieties of rice were varied. In case of pulses and dhals cooking time, colour, size of the dhal were studied. Characteristics preferred by different groups of population are different.

Varietal differences were observed regarding the nutritive value of vegetables and fruits. Proteins, total sugars, β carotene, vitamin C were the nutrients mainly studied.

SYMP.I
1.3

ICDS : PERFORMANCE EVALUATION - A FOUR STATE STUDY

K.V.R.RAMESHWAR SARMA
Senior Research Officer
National Institute of Nutrition
Hyderabad-500 007

Children and women of child bearing age form the most vulnerable segments of population in respect of health and nutrition. Several development programmes have been instituted to address these important segments and the Integrated Child Development Services (ICDS) is the first programme to deliver its components in an integrated (package) way. In pursuance of the National Policy for children, it was launched in 33 experimental blocks in 1975. Children below the age of 6 years, pregnant and lactating women and women in the age group of 15-44 years are provided with different package of services. Success of this programme prompted the Government to expand the scheme and today there are about 2430 projects spread over in all the States and Union Territories. Strengthening of the existing scheme and further expansion of it to areas which are yet to be covered is contemplated so as to achieve better Human Resource Development. The impact of this programme was periodically assessed by the Central Technical Committee of ICDS and also by a number of independent agencies. The National Institute of Nutrition has recently undertaken "Performance evaluation" ofICDS in the States of Andhra Pradesh, Bihar, Madhya Pradesh and Orissa. The salient findings will be presented and discussed.

SYMP.I
1.4

DEVELOPMENT AND WOMEN'S HEALTH - SOME KEY ISSUES

C.R.SOMAN
Medical College
Trivandrum

The continuing improvement of the health of women is central to improvement of health of children and thus of the future citizens. Country experiences indicate that health of women improves when educational and socio-economic standards improve. In India, the efforts to improve the health standards of women have so far been centred specifically on interventional programmes aimed at a single outcome like correction of anaemia through large scale distribution of iron-folic acid tablets or improvement of general nutritional standards through supplementation. Independent evaluations of these efforts suggest that such approaches have generally failed to make significant impact on the health of women and adolescent girls.

Overall development of the society, on the other hand, brings about tangible, albeit, slow improvement in the health of women. Though increased income is crucial in bringing about overall improvement in health status of women, the gains can be consolidated only if conditions are created for practising the knowledge acquired by women. Poverty as such need not be the single major constraint in health development if access to available health care is provided to women who are knowledgeable in the basic

attributes of health and nutrition. The lessons of Kerala are important in this context. However, in a culture which now witnesses an alarming growth of drinking and use of tobacco by men, health improvement of women and children is jeopardised. This highlights the urgency of the need to create income generating activities for women coupled with proper health education efforts.

19th December 1992

Venue : ASSEMBLY HALL

Time : 02.00 p.m. - 04.00 p.m.

Symposium - II : NEWER METHODOLOGIES IN NUTRITION RESEARCH

Chairpersons : Dr. P. Siva Reddy
Dr. M.S. Bamji

Rapporteur : Dr. T.C. Raghuram

Speakers : Dr. Narender K. Sehgal
Dr. Y.G. Deosthale
Dr. Subadra Seshadri
Dr. N. Raghuramulu

Sponsored by DST, CSIR, ICMR & RSI

SYMP.II
2.1

NUTRITION COMMUNICATION : THE INDIAN CHALLENGE

NARENDER K. SEHGAL
National Council for Science & Technology Communication
New Delhi - 110 016

Nutrition communication has to be seen as a part of the wider science and technology communication effort. Awareness and appreciation of the relevant nutrition-related problems, their analyses and possible solutions, and strategies for communication of the same have to be worked out in relation to the requirements of a given target group. In addition to the protein, vitamin, mineral and iodine deficiency related diseases, it is now widely recognised that a substantial portion of the nutritional problem in India stems from the fact that the affected persons do not get enough to eat. An attempt would be made in this presentation to suggest nutrition communication approaches borne out of experiences which have proven successful in other similar situations. These approaches are rooted, as they ought to be, in our peculiar problems and try to cater to the peculiar requirements of the Indian people. They allow use of all possible media - modern traditional, folk, electronic, non-electronic, and any other possible - singly or in a mix.

SYMP.II
2.2

NUTRIENT ANALYSIS

Y.G.DEOSTHALE
National Institute of Nutrition
Hyderabad-500 007

Analysis of foods for nutrient content is an important aspect of nutrition research. The data so generated form the basis of National Food Composition Tables, which have wide applications and are extensively used. Increasing interest in and concern for the relationship between diet, food habits and degenerative diseases has stimulated current interest in detailed chemical data on both nutrients and non-nutrient components of foods. The usefulness of any data base on nutrient composition of foods rests on the quality of the data used to construct it. Thus, analytical procedures adopted, play a vital role in nutrient analysis of foods.

For many nutrients a number of procedures are available that give comparable results. Most of the conventional procedures are time consuming but they are still valid and applicable. The newer procedures though fast and sensitive, require extensive instrumentation and capital investment. Conventional or established methods for major nutrients like total protein and fat content are slow, laborious and sometimes hazardous. Improved procedures including near infra-red reflectance procedure need extensive calibration with specific product but enhance the efficiency of the analyst. Advances in chromatographic procedures such as liquid, gas liquid and high performance liquid

chromatography now enable one to obtain detailed information on the composition of major nutrients; amino acid composition of protein, fatty acid composition of fat and the hitherto neglected carbohydrate profile also. Resolution and quantitation of vitamin A precursor carotenoids is possible by high performance liquid chromatography, a technique which can be used for determination of several other vitamins also. The advent of atomic absorption and emission spectroscopy has proved to be a boon for trace metal analysis of foods.

The merits and demerits of these and other new procedures of nutrient analyses will be discussed.

SYMP.II
2.3

BIOAVAILABILITY OF MICROELEMENTS WITH SPECIAL REFERENCE TO IRON

SUBADRA SESHADRI

Department of Foods & Nutrition
M.S.University of Baroda
Baroda-390 002

The significance of the concept of bioavailability of microelements is related to the fact that it is not just the total quantity of the mineral ingested but it is the amount that is actually available for absorption that determines its nutritional adequacy. Food consumption surveys may provide an indication of the total amount of the mineral ingested but they do not provide any indication of how much of the ingested microelements is made available to the body. Assessment of the bio-availbility fraction of the microelements calls for the application of special procedures. Although, ideally, bioavailability of a nutrient must represent that proportion of the nutrient which is absorbed, transported to its site of action and converted to its biologically active form, the inability of current methods to differentiate between the amount utilized and amount stored has led to the term bioavailability being used synonymously with absorption, especially in relation to microelements. Among the microelements the bioavailability of iron has been studied extensively with the use of radioactive and stable isotopes. These methods however prove to be expensive and invasive and therefore, simpler and newer methods in the form of in vitro procedures have been developed. The advantages and limitations of the in vitro

method as applied to the assessment of bioavailability of iron will be presented and discussed.

SYMP.II 2.4

BIOCHEMICAL METHODS FOR ASSESSMENT OF NUTRITIONAL STATUS

N.RAGHURAMULU
Deputy Director (Sr.Grade)
National Institute of Nutrition
Hyderabad-500 007

In the gradual deficiency of any nutrient, there occurs, first a depletion of body stores which is usually accompanied by changes in its concentration in the blood and reduced urinary excretion of the nutrient or its metabolites. Single, static biochemical measurements that are commonly used do not capture the dynamic metabolic situation that is most closely related to nutritional status. Short-term dose response tests provide reliable information about nutritional status for some nutrients, but this may not be true for others. Vitamin A and iron nutritional status can be assesed by in vivo dose response tests, where as in vitro enzyme stimulation tests for thiamine, riboflavin, pyridoxine and selenium are widely used. Biochemical tests frequently employed for assessment of nutritional status can be classified into two categories : (1) Estimation of blood or urine levels with or without the administration of a test dose and (2) Measurement of an enzyme activity that is specifically dependent on the nutrient, or change in the levels of metabolites. Water soluble vitamins have limited storage in the body and their concentrations in body fluids are usually proportional to those in tissues. Protein nutritional status can be assessed by the estimation of plasma specific proteins or specific amino acids, urinary excretion of specific amino

acids and other nitrogen containing compounds. The assessment of energy expenditure can be made using room indirect calorimeters. The development of the double labelled water method is a very useful technique for the measurement of energy expenditure. The choice of biochemical indicators and their measurements may vary depending upon the need and the objective. There is nothing like 'single best indicator' in a general sense. The definition of 'best' depends ultimately on what is more appropriate for the decision that must be made.

18th December 1992

Venue : ASSEMBLY HALL

Time : 11.00 a.m. - 01.20 p.m.

YOUNG SCIENTISTS' AWARDS SESSION-I: **Community Nutrition**

JUNIOR AWARDS

Chairperson : Dr. Vinodini Reddy

AWARDS
CNJ-1

1. EPIDEMIOLOGICAL STUDY OF NUTRITIONAL RISK FACTORS IN URINARY STONE DISEASE

S.CHATURVEDI, D. NAYAR, U. KAPIL and P.N.DOGRA

Department of Human Nutrition and Department of Urology
All India Institute of Medical Sciences
New Delhi

Patients (n=100) suffering from urolithiasis attending the urology out patient department constituted the study population. Information was collected on residential area, socio-economic status, dietary pattern with special emphasis on nutritional risk factors etc. on a pretested structured open-ended questionnaire. Equal number of subjects constituted the control group and were studied on a similar pattern. The study revealed that majority of the patients were from the stone belt area of the country. The prevalence was more frequent in males than females. Non-vegetarians developed urinary calculi more frequently than vegetarians. The prevalence was associated with the consumption of tea, smoking and alcohol. The amount of water consumed by the majority of patients was inadequate. Frequency of consumption of calcium and oxalate rich foods was high. Twenty three percent of the patients showed family history of urolithiasis.

AWARDS
CNJ.2

2. NUTRITION EDUCATION FOR ADOLESCENTS THROUGH GAMES

VIJAYLAKSHMI RAMAMOHAN and P.R. REDDY
Department of Home Science
S.V.University, Tirupati

Today, the importance of Nutrition education in the community does not require any undue emphasis. Nutrition education aims at controlling decisive and significant factors which precipitate or perpetuate malnutrition. It helps to formalise and internalise awareness of foods and Nutrition among people. In a developing country like India, nutrition education gains further significance. In India various health and nutrition intervention programmes are being implemented. But these programmes focus on the women and young children (0-6 years) and rural youth. A Programme specifically developed for the vulnerable adolescent is yet to come to the fore. Well conceived and suitably framed nutrition intervention programmes wherein, emphasis is on eduation of the adolescents are almost non-existence. Therefore, this piece of research was taken up to develop and implement a nutrition education programme for the school going adolescents. The learning medium was games - an interest based activity of adolescents. The aim was to develop and improve awareness of nutrition and its relationship to health in terms of food selection, consumption, and nutritional requirements of the adolescent. A nutrition games kit consisting of 16 games was developed and field tested. These games were played in the Government recognised high schools - both English and Telugu

mediums of instruction, by the adolescents (13-15 years). The impact of the games was assessed using a nutrition knowledge test developed by the investigator. Suitable statistical analysis was carried out to assess the pre and post test situations for the experimental (N-126) and control (N-80) groups. The results clearly indicate a significant improvement in the performance of the experimental groups when compared to the control groups. The study lays emphasis on the need to develop appropriate and innovative strategies to communicate important and relevant nutrition messages to the vulnerable adolescent groups.

AWARDS CNJ.3

3. DELOPMENT AND EVALUATION OF SOYA BASED WEANING FOOD FORMULATIONS

P.VASANTHI, M.SYLVIA and USHA CHANDRASEKHAR
Sri Avinashilingam Deemed University
Coimbatore

This study was conducted to evaluate the effect of substituting soya flour in the place of green gram dhal or bengal gram dhal and groundnuts in the weaning food called Kuzhandai Amudhu prepared by Avinashilingam University, which had as ingredients a cereal-Cholam, ragi or maize a pulse-Green gram or Bengal gram dhal, groundnut and Jaggery in the ratio of 3:2:1:2. Six weaning formulations were developed by substituting soya flour in place of dhal and processing the cereal components by malting in three mixes and roasting in the other three. The mix containing malted maize, defatted soya flour and jaggery was further subjected to feeding trial on 30 infants and toddlers. Another group of 30 infants and toddlers served as unsupplemented control. The differences in all the anthropometric measurements taken between experimental group and control group was significant at one percent level. The mothers of the infants and toddlers supplemented were given nutrition education and impact evaluated.

AWARDS
CNJ.4

4. DIETARY NUTRITION INDEX (DNI) - A NEW APPROACH TO THE QUALITY ASSESSMENT OF THE DIET

MANJULA P.BARIGIDAD, M.R. ADVANI and RAMA K.NAIK

As a measure of nutritional status of an individual in terms of nutrient intake, Dietary Nutrition Index (DNI) was formulated as a sum of standardized nutrient intake values. A study pertaining to DNI in terms of age, sex and socio economic status of a sample of 198 adolescents of Dharwad urban area, revealed positive correlation between DNI and SES and significant differences between sex and age groups. Scope for improving DNI by attaching weights to nutrients or by carrying out combined estimation procedures, is suggested:

Information on consumption of daily food intake helps in assessing indirectly, the nutritional status of individuals in terms of food adequacy. The data pertaining to food intake is collected by several methods such as questionnaire, one or three day recall, weighment method and the like. The quality of diet inturn is assessed by the adequacy of nutrients which are computed based on the dietary data and the existing national recommendation of nutrients to a particular population. In the field of diet survey adequacy of individual nutrients is computed and evaluated separately. An attempt has been made in the present study to evolve a method to assess nutrient adequacy in a diet by totalling the standardized values of the nutrient intake among adolescents. Perhaps this is an ideal method to assess the effect of total nutrients together in a

diet. It also helps in comparing nutrient adequacy of different populations.

AWARDS CNJ.5

5. A STUDY ON THE EFFECTS OF IODISED SASLT ON THE IODINE SALT ON THE IODINE STATUS AND PREVALENCE OF IODINE DEFICIENCY DISORDERS AMONG PREADOLESCENT

ZUBEDA A. TUMBI and NINA S.DODD
Post Graduate Department of Food Science and Nutrition
S.N.D.T. Womens University, Bombay

The effect of iodised salt on the iodine status and prevalence of Iodine Deficiency Disorders was studied in Preadolescent school children from low socioeconomic group. Initial screening based on clinical examination of 1073 children showed a Total Goitre Rate (TGR) of 26.5% in girls as compared to 21% in boys. Both TGR and VGR (Visible Goitre Rate) were higher in girls as compared to boys. No significant differences in mean height, weight, MUAC, and BMI of normal children or those with different grades of goitre were found. Urinary Iodine Excretion (UIE) of children with goitre was significantly lower than those without goitre. In subjects with grade II goitre mean UIE - 3.86 $\pm$ 0.72 mcg/dl and Iodine Creatinine Ratio (I/C) level of 92.1$\pm$ 25.2 mcg/gm indicated mild iodine deficiency. Seventeen percent of the preadolescent had UIE levels less than 2 mcg/dl indicating severe iodine deficiency. Moderate Iodine deficiency UIE level 2 - 3.5 mcg/dl was seen in 10% of the subjects with 12% having mild iodine deficiency UIE level 3.5 - 5 mcg/dl. Thyroid Hormone level (T3,T4,TSH) in preadolescents were found to be consistent with euthyroid status. After supplementation with iodised salt for six months, a significant increase in the percentage prevalence of '0' grade goitre from 42% to 62% was seen. In the grade

Ia category, there was a decrease from 40% to 26%. Grade Ib and II also showed a decrease in percentage prevalence from 15.8% to 9.8% and 2% to 1% respectively.

AWARDS
CNJ.6

6. IRON DEFICIENCY IN INDIAN SPORTSWOMEN AND THE EFFECT OF IRON SUPPLEMENTATION

MANU ANAND and NINA S.DODD
S.N.D.T. Women's University
Bombay-49

The iron status of Indian sportswomen from various colleges and sports - camps in Bombay was assessed in this study. The effect of iron supplementation on their iron status and physical work capacity was studied. The subjects' haemoglobin was determined by cyanmethaemoglobin method, serum ferritin by radioimmunoassay and physical work capacity by a treadmill test. A twenty-four hour dietary recall was used to estimate the caloric and nutrient intakes of the sportswomen. It was observed that 80 percent of the subjects were anaemic. Anaemia was of mild (Hb 10-12 g/dl - 38.4 percent), moderate (Hb 8-10 g/dl - 33.6 percent), and severe (Hb < 8 g/dl - 8 percent) types. Low to empty ferritin stores indicating latent anaemia were seen in 86 percent of subjects. The haemoglobin and serum ferritin levels of the anaemics were significantly lower than those of non-anaemics. The caloric and nutrient intakes of anaemic sportswomen were significantly lower than both the Recommended Daily Allowance and the intakes of non-anaemic sportswomen. The perfromance of non-anaemics on a treadmill test was significantly better than that of anaemic sportswomen. Oral iron administration brought about significant increases in haematological and biochemical parameters of anaemic sportswomen (Hb + 1.4 g/dl, serum ferritin + 18.3 ng/ml) and improved their physical work capacity.

AWARDS
CNJ.7

7. UTILIZATION OF RED PALM OIL IN THE DIETS OF PRESCHOOL CHILDREN FOR OVERCOMING VITAMIN A DEFICIENCY

DEEPALI and S.MATHEW
College of Home Science Agriculture University
Bikaner, Rajasthan

One hundred children in the rural area of Bikaner was assessed for dietary intake & nutritional status with respect to Vitamin A deficiency. Their diet consisted mainly of Bajra preparations and was deficient in other food items like pulses and leafy vegetables. Prevalences of vitamin A deficiency and anaemia were found higher in this group. Night blindness, Keratomalacia, X-xeropthalmia were the major clinical symptoms noted in the malnourished children. Red palm oil which is one of the richest source for Beta carotene, was incorporated at different levels in the local dishes, which are familier to the children. Incorporation of Red palm oil at 10-15% level was well accepted by the subjects. The dishes were fed to the children for a period of 21 days. Serum vitamin A level and nutritional status of children were also recorded.

18th December 1992

Venue : ASSEMBLY HALL

Time : 11.00 a.m. - 01.20 p.m.

YOUNG SCIENTISTS' AWARDS SESSION-I: **Community Nutrition**

SENIOR AWARDS

Chairperson : Dr. Shanti Ghosh

AWARDS CNS. 1

1. THE TAMIL NADU INTEGRATED NUTRITION PROJECT : EVIDENCE FOR IMPACT ON CHILD GROWTH

MEERA SHAKER, JEAN-PIERRE HABICHT and MICHAEL C.LATHAM
Division of Nutritional Sciences
Savage Hall, Cornell University
Ithaca, New York, USA

The Tamil Nadu Integrated Nutrition Project (TINP) was initiated in rural Tamil Nadu in October 1980. It targeted 6-36 month old children and pregnant and lactating women. This paper supports the claims for the impact of the TINP on the growth of young children. Mean weights of target children at the start of the TINP were compared with those after six years of program implementation. Children in November 1986 were heavier than those in November 1980. These differences were statistically significant from 6 until 25 months of age. After statistical adjustment for age, sex, income, family structure and family size, the mean predicted weights of children participating in the program were higher in 1986-87 as compared to those in 1980-81. In 1980-81, children who did not participate regularly were heavier than those who did. This reflects program targeting strategies i.e. targeting the worstoff. In 1986-87, despite a continuation of the same targeting strategies, children who participated regularly were heavier than those who participated less. This implies program impact among the most needy. Further, results from regression analyses support the postive effect of growth monitoring in TINP on improved weights of children in 1986.

AWARDS
CNS.2

2. PREVALENCE OF GOITRE IN KANGRA DISTRICT (HIMACHAL PRADESH)

SUMATI R.KATARIA* and KANTA K.SHARMA**

Food Science & Nutrition, College of Home Science
HPKV, Palampur

Foods & Nutrition, Punjab Agricultural University
Ludhiana, Punjab

Epidemiological survey for goitre was carried out on 1157 school children (4-18 years) belonging to five different schools of Jawali and Maira of Kangra District (H.P.). The clinical examination of all school children for goitre was done by the method suggested by WHO (1979). The identification of the degree of goitre was done with the standardised inspection and palpation, according to PAHO/WHO (1983) classification.

An overall goitre prevalence of 50.5% was observed in the surveyed school children (4-18 years). The maximum prevalence of 64.3% was found in the age group of 16-18 years, followed by 57.9% in 13-15 years, 48.3% in 10-12 years, 45.5% in 7-9 years and 16.1% in 4-6 years age group. Among the goitrous children, the maximum proportion (44.2%) of children suffered from grade Ib followed by 43.0% Ia, 12.7% II and only 0.1% had grade III of goitre. It has also been observed that with the advancement of age, the goitre prevalence increased.

AWARDS CNS. 3

3. ROLE OF DIET AND REGIONAL ADIPOSITY IN HYPERTENSION

K.VIJAYALAKSHMI, K.MALLIKARJUN RAO, T. PRASANNAKRISHNA, T.C.RAGHURAM, B.V.S.THIMMAYAMMA, A.NADAMUNI NAIDU and K. KRISHNASWAMY
National Institute of Nutrition
Indian Council of Medical Research
Hyderabad-500 007

Objectives : To assess diet, anthropometry, lipid profile and carbohydrate intolerance in hypertensives with specific reference to salt and fat intake and regional adiposity.

Design : Case Control Study

Setting : Out patient Department of local General Hospital.

Subjects : Men and women (158) of middle income group, free from diabetes and renal disorders, aged between 30-50, diagnosed for the first time as hypertensives (BP > 140/95 mm/Hg) were selected along with equal number of controls.

Study Protocol: Clinical history and examination followed by anthropometric measurements and 24 hour dietary assessment were made. In a sub-sample, blood was analysed for lipids, glucose and insulin in fasting as well as post load samples. Serum electrolytes and urinary electrolytes on home diets were also estimated.

Results : Significantly higher body mass index (BMI) and waist/hip ratio (WHR) was observed in both male and female hypertensives with elevated plasma glucose and insulin levels in females. These results suggest a role for regional adiposity and insulin resistance in the development of hypertension. In addition to anthropometric parameters, dietary intake of fat and salt were positively correlated with blood pressure. Odds ratio calculated for these data

also revealed a high risk for parameters such as BMI, WHR, plasma triglycerides, post load glucose, insulin and higher intake of dietary fat and salt.

Outcome : The results of the study suggest that BMI and WHR are the strong risk factors for hypertension and dietary intake of salt needs to be reduced to control blood pressure. Further physical exercises have to be promoted preferably to reduce abdominal fat.

AWARDS
CNS.4

4. IMPACT OF NUTRITION COUNSELLING AND SUPPLEMENTS ON THE MINERAL NUTRITURE OF RURAL PREGNANT WOMEN AND THEIR NEONATES

RAJBIR SACHDEVA and SUKHWANT K. MANN

College of Home Science
Punjab Agricultural University
Ludhiana

Sixty six young women from low and lower middle income groups were selected from 8 villages of Ludhiana district in I Trimester of pregnancy & divided equally into Experimental (E) and Control (C) groups. Iron (60 mg), folic acid (500 ug), calcium gluconate (500 mg), ascorbic acid (15mg), Vitamin B12 (1 ug) and vitamin D3 (100 IU) were supplied to E group from IInd trimester till delivery along with regular medical supervision and nutrition education about additional nutrient needs. Intake of all nutrients was less than the Recommended Dietary Allowances in the E and C groups during III Trimester. However, the requirement of iron, folic acid vitamin B12, and ascorbic acid, were met in the E group due to supplementation. The Fe, Ca & Cu levels improved significantly ($P<0.01$) during III trimester in E group. The cord serum levels of Fe, Ca & Cu wre also significantly ($P<0.01$) higher in E group. The relationships between maternal and cord blood levels of Fe, Ca and Cu were also significantly ($P<0.01$) higher in E group. The relationships between maternal and cord blood levels of Fe, Ca, Cu and Zn were significant ($P<0.01$), the coefficients of correlation being 0.67, 0.92, 0.97 & 0.43 respectively. Serum Mn had non-significant correlation with other minerals. The results

indicated that 86.7, 94.7 & 44.8 percent variation (r^2) in cord serum Ca, Cu & Fe levels was determined by the corresponding maternal serum levels. It has been observed that regular medical supervision, supplementation and nutrition education significantly ($P<0.01$) improved the nutriture of the pregnant and neonate.

AWARDS
CNS. 5

5. THE EFFECT OF PHYSIOLOGICAL STATE ON THE NUTRITIONAL STATUS OF WOMEN

M.SAI LEELA* and B.R. BUSI**

*Department of Home Science, St. Joseph's College for Women Waltair
** Department of Anthropology, Andhra University, Waltair

In a study covering 726 Andhra women, the effect of physiological state on the nutritional status and the factors influencing the nutritional status through physiological state were assessed with a view to make recommendations to improve the nutritional and health status of women. The investigations pointed out that the nutritional status of women was indeed influenced by their physiological status. Among the different physiological status, lactation seemed to affect the nutritional status. The lactation dependent stress was more profound in those experiencing post partum amenorrhoea. The incidence and length of post partum amenorrhoea was in turn influenced by the dietary habits during pregnancy and lactation. Hence there is a need to educate the women to improve their dietary intake during lactation.

AWARDS CNS. 6

6. IODINE INTAKE IN A GOITRE ENDEMIC AND A NON-ENDEMIC AREA OF PUNJAB

RITA JAIN and KANTA K. SHARMA
College of Home Science
Punjab Agricultural University
Ludhiana, Punjab

Dietary deficiency of iodine is one of the major causes of endemic goitre. To study the intake of iodine and its correlation with prevalence of goitre, epidemiological survey was undertaken. On the basis of this survey, food intake of 60 school children (10-12 years old), 30 each from a selected goitre endemic and a non-endemic area of District Ludhiana, Punjab, was collected for one day each in summer and winter separately by duplicate sampling technique. Iodine content was determined by Kinetic Assay method. The Mean±SD of daily intake of iodine from diet (food & water) and food alone by children in endemic area was 93.64±31.62 ug and 84.87±30.88 ug and non-endemic area 114.47±30.38 ug and 92.66±27.86 ug respectively. The intake of iodine from food by children consuming non-iodized salt was 52.33±12.35 ug and 72.61±14.68 ug in endemic and non-endemic areas respectively ($p<0.01$). The goitre prevalence in endemic area was 46.7% and in non-endemic 11.6%. Thus a significant inverse correlation ($p<0.01$) was established between iodine intake and prevalence of goitre.

19th December 1992

Venue : ASSEMBLY HALL

Time : 11.10 a.m. - 01.00 p.m.

YOUNG SCIENTISTS' AWARDS SESSION-II : **Experimental Nutrition**

JUNIOR AWARDS

Chairperson : Dr. S. Gnanasundaram

AWARDS ENJ. 1

1. IMPACT OF THERAPEUTIC NUTRITIONAL COUNSELLING ON THE NUTRITIONAL STATUS OF PATIENTS WITH CHRONIC LIVER DISEASES ATTENDING AIIMS HOSPITAL

DEEPIKA NAYAR, SWAPNA CHATURVEDI, UMESH KAPIL, and S.K.ACHARYA

Department of Human Nutrition
Department of Gastroenterology
All India Institute of Medical Sciences
New Delhi

All the patients (72) attending the liver out patient department constituted the study population. The patient's were assessed for their disease condition and nutritional status by a team consisting of 2 physicians, 1 nutritionist and 2 dieticians. The data was collected on nutritional parameters viz. anthropometric measurements, dietary intake and biochemical parameters. The nutritional support required for each patient was decided by the team and the specific therapeutic nutrition counselling was conducted. A high prevalence of malnutrition amongst patients with chronic liver disease was observed. The results revealed that 74% of the patients had values of MUAC as 90-60% of the standard and 46% had values of TSF less than 60% of the standard. The mean energy intake of calories amongst the males was 1393 Kcals and in females was 929 Kcals. Thirty patients attended followup clinic regularly. Comparative values of nutritional parameters at the first and final followup revealed that the mean MUAC and TSF values increased. However, there was no significant change in mean body weight of patients. The same was found true for the mean values of serum protein and serum albumin. After

AWARDS ENJ. 2

2. PHYSIOCHEMICAL AND BIOLOGICAL PROPERTIES OF RAW AND OXIDISED MAHUA OIL

D.S.KOTWAL, S.A. VALI and N.V. SHASTRI*

Department of Home Science and Biochemistry*
Nagpur University
Nagpur-440 010

Groundnut oil (GNO) and Mahua Oil (MO) were heated at 180 degree centigrade for 8 hours both with and without intermittent frying of fryums'. Thermal degradation as measured by changes in Colour Development, Viscosity, Smoke Point, Acid value, Peroxide Value, Iodine Value and Conjugated Dyne Hydroperoxide Values (CDHP) were found to be higher in MO than in GNO. Albino rats of either sex fed on diets with raw MO for a period of three months showed good growth and were found to be comparable to Raw GNO diets. Intake of oxidised (heated and fried) forms of MO and GNO affected adversely the food intake and consequently weight gain of female rats. Rats of either sex fed on heated GNO exhibited normal histology, while heated MO fed rats showed moderate hepatic hypertrophy with only one rat out of four exhibiting unilateral atrophic testicular damage. The fried GNO and MO showed more damage to liver of the male rats, while the kidneys and ovaries of all rats fed either on raw or oxidised forms of GNO and MO exhibited normal histological architecture.

AWARDS ENJ.3

3. STUDY OF PROTEOLYTIC ENZYME LEUCINE AMINO PEPTIDASE, AMINO ACID UPTAKE AND LIPID COMPOSITION IN THE SMALL INTESTINE OF MALNOURISHED YOUNG RHESUS MONKEYS

D.GUPTA, S.V.RANA, S. MEHTA and S.K. MEHTA

Department of Gastroenterology
P.G.I.M.E.R. Chandigarh

Mild to moderate protein energy malnutrition (PEM) was induced in young developing rhesus monkeys by giving them half of the casein based synthetic diet which was given to the control animals. Controls received 4.84 g protein and 110 kcals/kg body weight/day. After reduction in body weight to the extent of 25-30%, animals were sacrificed. The small intestine was removed flushed with ice cold saline, everted and divided into proximal, middle and distal parts. Brush border membrane vesicles (BBMV) were prepared from all the three parts and assayed for marker enzymes e.g. sucrase, Alkaline-phosphatase to assess the purity. Sucrase was found to be purified 23 folds and alkaline phosphatase 12 folds as compared to the respective homogenates in all the three parts. Vesicles were assayed for leucine aminopeptidase activity which was found to be elevated significantly in PEM induced animals in all the three parts of intestine. The amino acid uptake (U-^{14}C) L-leucine was also diminished and there was significant decrease in the levels of cholesterol and phospholipids. As a result there was an elevation in the molar ratio of cholesterol to phospholipids. This signifies a decrease in lipid fluidity and aminoacids uptake in the case of PEM in the small intestine. Histologically also there was evidence of mild to moderate villus atrophy.

AWARDS ENJ.4

4. ENHANCED MATERNAL METABOLIC EFFICIENCY DURING PREGNANCY IN UNDERNOURISHED WISTAR RATS

MARITINA PINTO and P.S. SHETTY
Nutrition Research Centre
Department of Physiology
St. John's Medical College
Bangalore-560 034

The effect of maternal undernutrition during pregnancy, on maternal energy expenditure was assessed in Wistar rats. Energy intake of the pregnant rats was restricted to 75% of the normal energy intake during pregnancy. Changes in maternal resting metabolic rates (RMR), capacity for Non-Shivering Thermogenesis (NST), spontaneous physical activity, pregnancy outcome, changes in maternal body weight and energy intake were monitored. While there was an increase in RMR and the capacity for thermogenesis in the ad libitum fed rats during pregnancy, the RMR, physical activity and thermogenic capacity were significantly reduced in the undernourished pregnant rats, indicating an increased metabolic efficiency in this group. Maternal undernutrition during pregnancy howerver, had adverse effects on foetal outcome, causing a reduction in litter size, litter weight and increased foetal resorption. The pregnant rats maintained their body weights at the expense of foetal growth, thus supporting the hypothesis that the foetal rat is not a metabolic parasite' of the mother. Although metaboic efficiency increased in undernourished pregnant rats, the energy conserved was not adequate to maintain normal foetal growth.

19th December 1992

Venue : ASSEMBLY HALL

Time : 11.10 a.m. - 01.00 p.m.

YOUNG SCIENTISTS' AWARDS SESSION-II : **Experimental Nutrition**

SENIOR AWARDS

Chairperson : Dr. Meenakshi N. Mehta

AWARDS ENS. 1

1. EFFECT OF ACID STABILIZATION OF RICE BRAN ON NUTRITIONAL QUALITY OF PROTEIN CONCENTRATES

JAMUNA PRAKASH and G.RAMANATHAM

Oilseed Technology Area
Central Food Technological Research Institute
Mysore

Protein concentrates were prepared from unstabilized and acid stabilized rice bran and either freeze dried or roller dried. Protein content of above samples ranged from 71-72%. They were assessed for their nutritional quality by both *in vivo* and *in vitro* assays. The essential amino acid profile of rice bran protein concentrates was comparable to rice proteins or rice bran proteins as such. Limiting amino acids of concentrates were threonine and isoleucine. Essential amino acid index for different samples ranged from 75.2 to 77.6. Lysine content was high (4.32 to 5.55 g/16 g N) of which 52 to 57% was available lysine. Freeze dried protein concentrate from untreated and acid stabilized rice bran exhibited very high *in vitro* digestibility both with pepsin as well as pepsin and pancreatin enzyme systems. Roller dried samples from untreated and acid stabilized rice bran showed high digestibility with pepsin and pancreatin but very low value with pepsin, indicating effect of heat on pepsin digestibility. The results of animal assays can be summaried as follows - The PER values of diets based on untreated and acid stabilized rice bran (at 10% protein level) were 2.10 and 2.18 respectively whereas corresponding values for protein concentrates were 2.16 and 2.34. Net

protein ratio and nitrogen utilization values from both roller dried protein concentrates were also high and not significantly different from the standard protein.

AWARDS
ENS.2

2. SPROUTING AND INDIGENOUS FERMENTATION OF SOYBEAN TO ENHANCE ITS UTILIZATION AND IRON AVAILABILITY

RAJ BALA GREWAL and B.M.CHAUHAN

Department of Foods and Nutrition
Haryana Agricultural University
Hisar

Germination and/or were employed to improve acceptability and iron availability of soyabean. After soaking for 12 h the seeds were germinated for 12, 24, 36 and 48 h at 30 degree centigrade. After dehulling and autoclaving both soaked soybeans and sprouts were dehulled, autoclaved, mixed with curd and the mixture fermented at 25,30 and 35 degree centigrade for 12, 24 and 48 h. Germination reduced phytic acid (52%) and saponins (13%) and improved the iron availability. Autoclaving and dehulling did not significantly improve the iron availability (both *in vitro* and *in vivo*). Indigenous fermentation reduced the level of phytic acid and saponin and enhanced iron availability (both *in vitro* and *in vivo*); effects were more pronounced with longer period of fermentation. Fermentation for 12 h at 25 and 30 degree centrigrade produced an organoleptically acceptable soy *rabadi* (both from soy bean and soy sprouts) and the products were free from beany flavour. Combination of germination and fermentation produced more desirable results.

AWARDS ENS.3

3. A REGRESSION EQUATION FOR PREDICTION OF IRON BIOAVAILABILITY FROM INDIAN MEALS ; AN EXPERIMENTAL STUDY

ANIMA N. ANAND and SUBADRA SESHADRI
Department of Foods and Nutrition
M.S. University of Baroda, Baroda - 390 002

The interaction effect of four constituents namely ascorbic acid, citric acid, tannic acid and calcium phoshpate was studied using a standard cereal meal (STD meal) providing 3 mg nonheme iron/250 ml homogenate. Based on the data, a regression equation was evolved which was tested for its predictive power as applied to a set of 10 typical Indian meals. Regression analysis of the data revealed that both ascorbate and citrate emerged as equally strong enhancers while tannate and calcium phosphate demonstrated strong inhibitory effect on iron availaibility in the STD meal. When the present regression equation was compared with the only other model available in the literature (Monsen and Balintfy, 1982) as applied to the typical Indian meals, it showed a far better correlation coefficient ($r = 0.76$) than that obtained with Monsen's model ($r = 0.19$) between the analysed values for iron availability vs the values computed using the enhancer and inhibitor contents of the meals. The findings of the present study substantiated the hypothesis that a regression model, evolved from a cereal meal, by integrating the effect of enhancers as well as inhibitors, rather than only enhancers, provides a more precise estimate of iron availability from typical Indian meals. A limitation of the model however, is that phytate could not be incorporated into the equation.

AWARDS ENS. 4

4. PROTEIN DIGESTIBILITY (*In vitro*) AND BIOAVAILABILITY OF MINERALS FROM HOME MADE SUPPLEMENTARY FOODS

SAROJ DAHIYA and A.C. KAPOOR
Department of Foods and Nutrition
CCS Haryana Agricultural University
Hisar-125 004

Least cost home processed supplement mixtures were developed using combinations of wheat, pearlmillet (bajra), bengal gram, green gram, groundnuts, amaranth leaves and jaggery. Simple domestic methods of processing i.e. roasting and malting were used in the preparations. Processing methods improved protein digestibility (*in vitro*) in all the developed mixtures due to reduction in the levels of antinutrients in processed mixtures and also due to catabolism of storage protein during malting of grains. Mineral availability in developed supplements and one commercial weaning food, cerelac was assessed using rats as experimental model. Pearlmillet based supplements were found to have significantly ($P<0.05$) higher values of apparent absorption, retention and balance of minerals i.e. (Ca, P, Fe, Zn, Cu and Mn) than those of wheat based ones and similar values to those of commercial weaning food. Roasting and malting significantly increased digestibility of HCl extractable minerals in all the formulations. The study suggests that these home made supplementary foods if fed to young children could serve as good supplements for improving their nutritional status.

nutritional counselling, 26% and 20% of the patients showed an increase in their calorie and protein intake respectively between the first and final followup.

18th December 1992

Venue : ASSEMBLY HALL

Time : 04.00 p.m. - 05.30 p.m.

FREE COMMUNICATION SESSION - I : **Community Nutrition**

Chairpersons : **Dr. Kamala Krishnaswamy**
Dr. Meera Patanker

SEP
CN.1

1. FOOD CONSUMPTION AND ENERGY EXPENDITURE PATTERN OF INDUSTRIAL WORKERS

MEERA PATANKAR and BHARATI, B.M.

College of Home Science
Dharwad

Food consumption, nutritional status, energy expenditure and health status were studied in 150 workers from 11 industries in Dharwad using diet survey, anthropometric measurements and factorial methods. The diets were cereal based; intake of protein, calcium, and iron was adequate; calories, retinol and riboflavin were inadequate. The health status of workers was good although the energy intake was low. There was a significant difference in energy intake and expenditure among the heavy, moderate, and light workers. Low socio-economic status was a contributing factor to the negative energy balance.

NUT-100
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COMMUNITY HEALTH CELL
326, V Main, I Block
Koramangala
Bangalore-560034
India

SLP CN.2

2. NUTRITIONAL STUDIES ON MIDDLE AGED WOMEN FROM AFFLUENT AND MIDDLE INCOME GROUPS IN AN URBAN SETTING IN BARODA

VANISHA PATEL and SUBADRA SESHADRI

Department of Foods and Nutrition
M.S. University
Baroda-390 002

Dietary intake, physical activity pattern, nutritional status by anthropometry and disease profile of 150 adult women aged 45-58 years, belonging to affluent (n=75) and middle income class (n=75) were assessed. A clear income related difference was seen in the dietary intake. The mean intakes compared with RDA showed iron to be indequate in both the groups (only 45% RDA). Prevalence of obesity/overweight (on the basis of BMI) was higher in the affluent and this was partly supported by their dietary patterns and lifestyles. The current profile of diseases compared with the past ten years showed a significant increase in the problems related to GIT, oral cavity, respiratory tract and CNS in both the groups. Menopausal problems were prominent among 45% of the women of both the cadres. Advancing age was thus a more important factor which determined the disease profile than their current socio-economic status.

SLP
CN.3

3. DIETARY NUTRITION INDEX (DNI) - A NEW APPROACH TO THE QUALITY ASSESSMENT OF THE DIET

MANJULA,P.BARIGIDAD,M.R.ADVANI, RAMA.K.NAIK and G.S.SHARADA
College of Home Science
University of Agricultural Sciences
Dharwad-580 008

As a measure of nutritional status of an individual in terms of nutrient intake, Dietary Nutrition Index (DNI) was formulated as a sum of standardized nutrient intake values. A study pertaining to DNI in terms of age, sex and SES of a sample of 198 adolescents of Dharwad urban area, revealed positive correlation between DNI and SES and significant differences between sex and age groups. Scope for improving DNI by attaching weights to nutrients or by carrying out combined estiation procedures, is suggested.

SLP CN.4

4. PREVALENCE OF OBESITY AND ASSOCIATED FACTORS IN THE ADULT RURAL POPULATION OF TRIVANDRUM DISTRICT, KERALA

V.RAMAN KUTTY, A.K. JAYASREE and JESSY THOMAS,

Sree Chitra Tirunal Institute for Medical Sciences and Technology
Trivandrum-695 011

Objective: To estimate the prevalence of obesity, as defined by Body Mass Index (BMI) 24.9, in the adult population of rural Trivandrum district, Kerala.

Methods: Cluster sample with probability proportionate to size, of 5 clusters (panchayats), with random sampling of 100 households from each cluster. All persons who have completed 25 years of age examined by standard anthropometric techniques. Sample size 1253. Response rate 90%.

Results : Overall prevalence of obesity was 14%, Obesity prevalence higher among females at all ages, and shows a tendency to increase with higher socio economic categories. Stepwise logistic regression with all relevant variables yielded a model with female sex (OR 2.2) and higher socio economic status (OR 3.7) having a higher risk.

Conclusion: Despite generally poor socio economic status, obesity has emerged as health problem of some importance in the rural popuation of Kerala, especially among females.

SLP
CN.5

5. NUTRITIONAL STATUS OF ADOLESCENT GIRLS BELONGING TO LOW INCOME GROUP

ANURADHA GOYLE and PRIYANKA SHARMA
University of Rajasthan
Jaipur

The study was conducted to determine the nutritional status of adolescent girls attending Government schools in Jaipur. The study was conducted on 103 urban school girls in the age group of 13-16 years falling in the low income group. The nutritional status was determined through dietary intake, anthropometry, presence of clinical signs and symptoms and haemoglobin levels in blood. The information was collected by interview schedule. The findings of the study revealed that the heads of the families were fourth class employees, the rest skilled or unskilled workers. The calorie intake of the girls was found to be below the RDA. Their diets were found to be inadequate in protein, calcium, iron, thiamin, niacin and riboflavin. Heights and weights of the adolescent girls were found to be comparable to ICMR values but lower than the NCHS data and data on affluent girls. The mean age at menarche was found to be 13.2 yars. Almost all the girls were found to be anemic as assessed by Tallquist method.

SLP
CN.6

6. GOITRE PREVALENCE IN KARNATAKA - A BASELINE SURVEY

B.K.SUGUNAMMANNI, T.CHANDRASEKHAR and JALAJA SUNDARAM

Goitre Cell, State Health Directorate
Bangalore, Karnataka

After the Goitre Survey revealed moderate endemicity in 3 selected Malnad Districts in Karnataka, the Goitre Survey was continued in all other Districts in Karnataka by a trained team using standard techniques of sampling and methodlogy applying W.H.O. grading. 1,98,877 individuals including school children were covered during the survey conducted in 16 districts. Among them, 11 districts revealed areas of endemic prevalence. Among the school children more than 10% prevalence was observed in 9 Taluks and 5 to 10% prevalence was observed in 12 Taluks in these districts. Adolescent age group and female population showed higher prevalence in all the districts. Prevalence of endemic goitre in some of the Maidan areas (dry zone) was an interesting observation. The results highlighted the problem of endemic goitre in many of the districts in Karnataka with occurrence even in dry zones and hence the need for universal iodisation of edible salt in the entire state as a preventive measure.

SLP
CN.7

7. COMPARISON OF DIETARY PATTERN OF FAMILIES IN SELECTED NON XEROPHTHALMIC AND XEROPHTHALMIC AREAS

LALITHA RAMASWAMY and R.RADHIKA

Department of Nutrition,
P.S.G College of Arts and Science, Coimbatore

The investigations were conducted in two villages identified as Xerophthalmia and Non-Xerophthalmia areas. Both areas had families belonging to lower socio-economic groups. Percentage expenditure on food was high and the families lived on two meals a day due to poverty. Though children ate three meals a day the adequacy of nutrients was found to be very low. Analysis of beta carotene content of foods of pre-school children showed that it did not meet the recommended dietary allowances. Clinical findings showed that 13.3% of pre-school children of Xerophthalmic area suffered from vitamin A deficiency. Serum Vitamin A levels of children of xeropthalmic area was very low (30 micro gram). Observations suggest that the intake of foods of animal origin and a low cost protein mix made with pulses and cereals which was available in the non-xeropthalmic area have prevented the onset of vitamin A deficiency signs. Massive doses of vitamin A and frequent supply of vitamin A supplements have also contributed to this. Therefore, though both areas belong to low income group, the intake of nutritious foods rich in Beta Carotene and Vitamin A and proper medical care have resulted in a community free from Vitamin A deficiency signs.

SLP
CN.8

8. NUTRITIONAL STATUS OF INSTITUTIONALISED ELDERLY : RELATED VARIABLES

MANISHA JHINGAN, SUSHMA SHARMA and A.WADHWA

Department of Foods and Nutrition
Lady Irwin College
New Delhi

In the present study, the nutritional status of institutionalised elderly, their health behaviour and the related socio economic factors affecting their nutrition was investigated. The sample comprised 84 elderly (71 women and 13 men) from three old age homes in Delhi. The nutritional status was assessed using interview and observation method. The techniques employed were dietary survey, anthropometry, clinical examination, blood pressure measurement and haemoglobin estimation. Strong food preferences and beliefs affected the dietary intake of the subjects. The mean daily intake of energy and other nutrients was adequate with the exception of vitamin A and iron. The interinstitutional comparisons revealed the superiority of diets of the inmates of one home. Protein and retinol intakes were significantly different among the residents of the three institutions. A significant correlation between the total arm length and height was observed. The mean arm and abdominal circumference of women was higher than men. Thirty three per cent of the population was hypertensive and 72% was anemic. The economic status of the inmates affected their purchasing power, the extent of supplementation of the institutional meals and ultimately the dietary quality. The factors like eduational level,

economic independence, higher social interaction and shopping independence ensured an adequate energy intake among the elderly.

SLP
CN.9

9. THE PREVALENCE OF ANAEMIA IN TEA GARDEN WOMEN WORKERS IN ASSAM IN RELATION TO PARASITIC INFESTATIONS

MADHURIMA CHALIHA KALITA

Department of Food and Nutrition
Assam Agricultural University
Jorhat-785013

Haemoglobin level, anthropometry and parasitic infection were determined in 55 tea garden women workers. The age of the women workers ranged from 25 to 35 years. Of the total 9 women were in different trimesters of pregnancy, 9 were lactating and 37 were non pregnant and non lactating. The study was planned to evaluate anaemia and the parasitic infection. Almost all the women without discrimination of pregnancy, lactation and non pregnant and non lactating stages were suffering from mild to severe form of anaemia. Out of the total sample assessed had haemoglobin level above 10 gm/dl. 10.91% between 8-9.9 g/dl., 65.45% between 6-7.9 g/dl and the rest 20.28% haemoglobin less than 6 g/dl. Further, the study revealed that 64% of the workers were infected by either protozoa or helminth. The haemoglobin value of those who were infected by either protozoa or helminth way 7.20 $\pm$ 0.04 g/dl and subjects who had neither protozoa nor helminth infection was 8.92 $\pm$ o.15 g/dl. These results were significantly different.

SLP
CN.10

10. NUTRITION BEHAVIOUR WITH REFERENCE TO INTAKE OF VITAMIN A RICH FOODS AMONG SOCIALLY DISADVANTAGED HOUSEHOLDS

L.I.BHATTACHARJEE, I.VARGHESE and S.A. UDIPI
Department of Postgraduate Studies and Research in Home Science
SNDT Women's University
Juhu, Bombay-49

Nutrition behaviour with reference to intake of vitamin A rich foods among socially disadvantaged households in general and by young children aged one to six years was studied.

The knowledge, attitude, and practices of the mothers and familial habits with regard to the intake of vitamin A rich foods was assessed among 200 households in an urban slum. Dietary and food purchasing practices showed that provitamin A foods were consumed by the adults in the family but were minimally consumed by majority of the young children. The mean calorie intake in majority cases was 70% of the R.D.A. and that of vitamin A was found to be less than 50%, and protein intake of majority of them was adequate.

Cooking competitions as part of generating nutrition awareness helped to reflect the mother's attitude towards usage of provitamin A foods. Ten per cent of mothers showed a good choice of food preparations while 63% exhibited a satisfactory food choice and the rest had a poor score. The food preference and selection test indicated that children preferred the colourful yellow and orange vegetables to other vegetables. This aspect should be promoted through

nutrition education programmes in school and community centres.

Such nutrition awareness generating activities not only create interest but also help to promote postive food behaviour.

SLP
CN.11

11. METHODS FOR NUTRITION EDUCATION-MEDIA MESSAGES ON VITAMIN A THROUGH DIFFERENT AGENTS TO RURAL WOMEN

Parvathi Rau*, Maya Natu,** T. Prasanna Krishna* and N. Pralhad Rao*
*National Institute of Nutrition, Hyderabad - 500 007,
**B.J. Medical College, Pune, India.

Nutrition Education on Vitamin A deficiency was carried out using Village Health Guides, Dais, Teachers and Youth Leaders, in two rural areas around Hyderabad and Pune, covering 27,000 and 36,000 population respectively. A baseline survey showed that night blindness was well-known but not associated with Vitamin A deficiency. A media package consisting of Radio, Television, Film/Slide Shows, Posters, Folders, Hoardings, Calender and Folk Media was developed and administered for 16 weeks. Terminal evaluation revealed that television continued to be a source of entertainment while knowledge about nutrition broadcasts and film/slide shows had improved significantly. Recall of messages, however showed different responses in the two areas. Visuals evoked the same response but the recall of messages was significant only in Hyderabad. Folk media gave the maximum response for awareness and recall of vitamin A messages in Hyderabad. Agent motivation of the respondents was found best for folk media, followed by audio-visuals and pamphlets. Youth leaders in Hyderabad and teachers in Pune were most successful as agents. The possible reasons for these varied responses will be discussed.

SLP
CN.12

12. ECONOMIC EVALUATION OF IODINE DEFICIENCY DISORDERS CONTROL PROGRAMME IN SIKKIM, INDIA

C.S. PANDAV

Centre for Community Medicine
All India Institute of Medical Sciences
New Delhi

OBJECTIVES

To determine whether a universal Iodated Salt Programmes (ISP) or Iodised Oil Injection Programme (IOP) targeted at high risk populations compared to the current situation of no programme is more economically efficient from a Societal Viewpoint to prevent Iodine Deficiency Disorders (IDD). The primary outcome measure is prevention of irreversible IDD (endemic cretinism, mild motor and mental impairment, stillbirths and neonatal deaths due to iodine deficiency). The secondary outcome measure is prevention of reversible IDD (endemic goiter).

STUDY POPULATION

The study was conducted in the State of Sikkim. The high risk populations include women in child bearing age group (15 to 44 years) and all children under age 14.

METHODS

Based on the results of recently concluded goiter prevalence survey in Sikkim (54%), an IDD model was used to estimate the prevalence of irreversible IDDs. Over the time horizon of 60 years (life expectancy at birth), the annual incidence of irreversible IDDs was estimated for ISP and IOP. Also a new measure, visible goiter person year (VGPY)

was developed to measure the change in the reversible IDD that occur as a result of ISP and IOP.

RESULTS

The incremental analysis showed IOP as a more cost effective alternative producing the following results over ISP : Rs. 1600 per case averted of endemic cretinism, Rs. 500 per case averted of mild IDD, Rs. 600 per IDD attributable death averted and Rs. 0.25 per VGPY averted and a net benefit of Rs. 3 million. These results were stable when a sensitivity analysis over different variables was done.

CONCLUSIONS

This study shows that IOP targeted at high risk populations is more efficient in this environment of high prevalence of IDD. A reassessment should be conducted when a partial control of these disorders is achieved.

SLP
CN.13

13. THE OUTREACH OF IODISED SALT IN NORTH EAST URBAN ASSAM

S.K.SHARMA, S.K. BENARA, D.HAZARIKA and K.SATYANARAYANA

Regional Medical Research Centre
N.E. Region (ICMR)
Dibrugarh, Assam

Evaluation of outreach of iodised salt in the retail shops situated on the National Highways passing through the state of Assam has been attempted. Samples of loose (common, crystalline) salts and different brands of packed salt marketed by retail outlets were purchased from 25 semi-urban settlements. Fifty shops were contacted for the purchase of salts. A total of 50 loose salt samples and 67 packed salt samples marketed by different companies were purchased and transported to the main laboratory. Analysis by classical volumetric method revealed that almost all (96%) samples of loose salt had iodine levels less than 15 ppm. About 58% of the packed salt samples had adequate levels of iodine. Independent evaluation of levels of iodine in the salt samples of the semi-urban and urban areas of Assam revealed 42% inadequacy even for the packed salts marketed by different companies. The need for control over the market forces is outlined.

SLP
CN.14

14. INFLUENCE OF NUTRITIONAL AND NON-NUTRITIONAL FACTORS ON THE MENTAL ABILITY OF SELECTED PRE-SCHOOL CHILDREN IN COIMBATORE CITY

JEMIMA B. MOHANKUMAR and M.SHEELA

Department of Nutrition and Dietetics
P.S.G. College of Arts and Science
Coimbatore

A study was conducted on the influence of nutritional and psychosocial factors on the mental abilities of selected preschool children in Coimbatore city. It was found that in the middle income group there was 100% literacy while it was only 57% in the low income group. Also the low income group families had to spend 54% of their income on food while middle income group families spent only 33% of their income. Though low income families spent a larger percentage of their income on food, the pre-school children of this group did not get sufficient amount of food. All varieties of food items were consumed in lower amounts in the low income group as compared to the middle income group. This reflected on the nutritional status of the pre-school children. Those of the middle income group were taller and heavier (17.34 kgs.) than those of the low income group (14.34 kgs.). Clinical assessment also showed better health among children of the middle income group. Psycho-social analysis was carried out through the questionnaire which assessed the mother's attitude towards her child and her childhood experience. It was found that 86.67% of mothers of middle income group had a positive attitude towards their children whereas it was 69.88% in the low income group. The mothers of low income

group showed less care and attention to their children. The mothers of the middle income group had greater concern for their family in several aspects, probably because they themselves had a good childhood experience. Mental ability of pre-school children was assessed through the different memory tests. It was found that children of the middle income group scored higher (75.5%) as compared to the low income group who scored 65.5%. For optimum mental development, a child is dependant on continuous stimulus interaction with the environment. Therefore, such studies in greater depth will provide a better insight into the pre-school child mental development.

18th December 1992

Venue : CONFERENCE HALL

Time : 04.00 p.m. - 05.30 p.m.

FREE COMMUNICATION SESSION - I : **Clinical Nutrition**
Other Categories

Chairpersons : Dr. Tara Gopaldas
Dr. P. Geervani

SLP
CLN.1

1. PSYLLIUM - A POTENTIAL HYPOCHOLESTEROLEMIC AGENT

NISHA BHANDARI and POONAM THAWANI

College of Home Science, Nirmala Niketan
Bombay-400 020

Only limited information is available on the response of Indian individuals to Psyllium treatment. The present study thus aimed at examining the ability of Psyllium hydrophilic mucilloid to lower serum lipid levels in normo and hyperlipidemic subjects. Fifteen non-diabetic adults were recruited for purpose of study. The experimental period comprised of three phases: the first being that of stabilisation, the second that of actual supplementation with Psyllium fiber and the final phase in which treatment was discontinued to reveal the duration of the hypocholesterolemic effect of Psyllium which may have been observed in Phase II. The first phase lasted for a period of three weeks and the later two phases comprised of a duration of four weeks each. Biochemical parameters assessed included serum total cholesterol and triglyceride levels. Estimations were carried out in all subjects, once in each phase of the study. Serum cholesterol registered a maxiumum reduction of 11% in hypercholesterolemic subjects at high risk for CHD. A significant reduction in the triglyceride levels was observed in the normotriglyceridemic subjects in phase II. The study throws light on the possibility that Psyllium could be considered an effective hypocholesterolemic agent with a probable role in the treatment of mild to moderate hypercholesterolemia.

SLP
CLN.2

2. THERAPEUTIC EFFECT OF HERBS, TURMERIC (Curcuma longa)AND AMLA (Embilica officinale) IN THE TREATMENT OF DIABETES MELLITUS

S.PONNE, PADMAVATHY, G. and PREMAKUMARI, S

Avinashilingam Institute for Home Science and Higher Education for Women (Deemed University)
Coimbatore-641 043

Forty two Non Insulin Dependent diabetic adults with the mean initial fasting blood sugar level of 140 mg per dl were divided into seven equal groups. Groups A and B received 10 and 15 g amla per day respectively, groups C and D received 10 and 15 g turmeric per day, while groups E and F received 10 and 15 g of amla and turmeric in combination (7.5 + 7.5g). The members consumed the herbs in two equal doses per day and did not take any drugs during the study. Group G served as the control. At the end of three months, the drop in the fasting blood sugar level in group B was found to be the highest followed by group F. The post prandial blood sugar level was significantly lower ($P<0.05$) in groups B and F than the initial level. The blood urea values remained unaltered. There was a greater decrease in urinary sugar level in all groups. In groups B and D three members, in groups E and F two members and in group C one member had 1+ sugar level after the treatment.

SLP
CLN.3

3. ROLE OF DIET IN CORONARY HEART DIESEASE

SIMMI OSHAN and SUBHASHINI VERMA

Department of Foods and Nutrition
Punjab Agricultural University
Ludhiana-141-004

Forty male patients (30-70 years) who had suffered an earlier heart attack were selected from the Christian Medical College and Hospital, Ludhiana. Their dietary pattern prior to the diagnosis of disease was recorded. The average daily intake of energy (2703 Kcal), protein (87 g) and fat (85 g) by the patients was significantly ($P< 0.01$) higher than the RDA's for Indians. But after the dietary counselling their daily intake of these decreased significantly and the refined oil replaced the saturated fats, the only form of fats consumed earlier by the patients. Fasting blood samples, drawn on the 2nd day of hospitalisation and after about 50 days, were analysed for serum lipids. The TG (202 mg/dl), total cholesterol (264 mg/dl), LDL Cholesterol (192 mg/dl) and VLDL-cholesterol (40 mg/dl) were significantly higher than desirable levels. These values decreased significantly after 50 days. All patients were leading a sedentary life and did not take any kind of physical exercise. The energy and fat intakes were found to be positively correlated with BMI & TSF Thickness and TG, total cholesterol and VLDL-cholesterol levels and also to systolic and diastolic blood pressure.

SLP
CLN.4

4. EXPERIENCE OF INDIAN DOCTORS ON THE SAFETY AND EFFICACY OF INTRAVENOUS AMINOACIDS

ZINOBIA M.MADAN, VINOD K.MATTOO, C.N.RAGHU and SURESH K.BOWLEKAR

Department of Clinical & Experimental Research
Wockhardt Ltd.
Bombay

In all stressful conditions, it has been observed by several workers that on account of increased catabolic activity resulting in mobilization of the skeletal muscle aminoacids, there is a greater loss of nitrogen as compared to the intake of nitrogen which is infact severely restricted. Intravenous aminoacids which provide the body an instantaneous supply of aminoacids to support many of its active functions also subserve a very important function of arresting the negative nitrogen state and helps the individual to reach a stage of nitrogen balance which ultimately helps the rapid convalescence and earlier rehabilitation of normal activity. In order to study the effect of intravenous aminoacids on the nitrogen balance a clinical study was undertaken. The results of the study showed that in those patients where aminoacid preparations were administered starting from the 1st day or 2nd day of treatment, nitrogen balance was restored anywhere between 4th to 7th day depending on the clinical status and the complication in each case. It was also observed that during aminoacid treatment it is most essential that the caloric requirement is met with by using calculated dose of intravenous dextrose.

SLP
CLN.5

5. ZINC SUPPLEMENTATION AND GLUCOSE CLEARANCE IN NIDDM SUBJECTS

D.PERAMMA, A.PADMAJA and J.VIJAYA

Food Science and Nutrition
Department of Home Science
Sri Venkateswara University
Tirupati-517 502

Sixty nonobese non-insulin dependent diabetes mellitus (NIDDM) subjects men and women (30 + 30) were selected from the clinics, nursing homes and the Government Hospitals in Kurnool. Out of them 22 were (12 men and 10 women) were found to be zinc deficient. From these zinc deficient subjects, 16 members (8 men and 8 women) were selected and given zinc sulphate (220 mg $ZnSO_4$, $7H_2O$) one capusule/day for 2 weeks as zinc supplement. There was a significant reduction in plasma glucose. Also a significant effect on GTT (Glucose tolerance test) was recorded. Zinc supplementation thus seems to be a necessity not only zinc deficient diabetes but also to zinc sufficient diabetics to keep the glucose levels under control and to help in the slow absorption of glucose.

SLP
CLN.6

6. IODINE STATUS IN PREGNANCY

JAGMEET MADAN and NINA S. DODD

Department of Food Science and Nutrition
S.V.T. College of Home Science
S.N.D.T. Women's University,
Bombay-400 049

The sample of the present study comprised of 240 pregnant women in different months of pregnancy, from the lower socio-economic strata of urban slums of Bombay. Total Goitre Rate (TGR) was found to be 40.3% and the Visible Goitre Rate (VGR) as 4.2%. The grades of goitre increased in the later months of pregnancy. Sixty percent of the women had urinary iodine excretion less than 5 mcg/dl, of which 20% had less than 2 mcg/dl, showing mild iodine deficiency distribution. High T3 and T4 levels were seen in 71.4% and 42.3% of the pregnant women respectively while only 1.2% of them had TSH levels higher than the normal range. No significant differences in the level of thyroid hormones (T3 and T4) were noted between euthyroid and goitrous subjects but the mean TSH levels in euthyroid women were significantly higher than those with signs of goitre.

SLP
OC.1

1.IMPACT OF PROTEIN ENERGY MALNUTRITION ON RENAL FUNCTIONS IN CHILDREN

GNANASUNDARAM,S

Institute of Child Health & Hospital for Children
Madras-600 008

Alteration in gastrointestinal functions, immuno-comptence as a result of various grades of malnutrition are well known. Similar studies on impact of malnutrition on renal functions and structure are lacking. 20 children aged 1-10 years suffering from various grades of PEM attending the Institute of child Health, Madras were studied. Children suffering from renal diseases, anomaly were excluded. Renal functions were assessed by clinical biochemical, radiological parameters and renal structural changes by Renal biopsy in 20% of cases. There were no significant clinical, biochemical and sonographic changes in Renal system in all the grades of malnutrition. However, renal biopsy revealed congestion and cellularity in glomeruli in all cases and mild dilatation, atrophic changes, epithelial desquamation and cloudy swelling in 33% of children. Observed normal integrity of Renal system and functions, clinically, biochemically, sonographically even in severe degree of malnutrition and definite changes in glomeruli and tubules by malnutrition itself, is to be kept in mind in evaluating the impact of infection, congenital anomalies and others of renal system on malnutrition.

SLP OC.2

2. IMPACT OF ICDS ON PSYCHOSOCIAL DEVELOPMENT OF CHILDREN

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*Niloufer Hospital, Hyderabad
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Hyderabad

A comparative study was conducted in 392 children of 3-5 years comprising ICDS, Non-ICDS and non-school going children. In each child (i) Anthropometric examination to assess nutritional status (ii) Family and Socio economic background studies and (iii) Psychosocial assessment were done. According to various criteria taken to compare ICDS and non-ICDS children, the results revealed the following: ICDS children showed significantly better psychosocial development compared to Non-ICDS children. In relation to Nutritional status ICDS children who had normal, mild, moderate nutritional grades showed better psychosocial performance. However, ICDS had no positive impact on severely malnourished children. As the family size increased significant differences were not observed between the 2 groups. Irrespective of castes, ICDS children showed better performance. Younger ICDS children irrespective of income groups, parental occupations, type and condition of the house showed better performance. This finding was not observed in older children. However, presence of toys, books, pictures at home helped both ICDS and non-ICDS children in their developmental process.

SLP
OC.3

3. ZINC STATUS OF PREGNANT WOMEN OF KANGRA VELLEY

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Zinc status of thirty pregnant women (ten each in first second and third trimester of pregnancy), aged 19-28 years and belonging to rural area of Kangra Valley of Himachal Pradesh, was determined by monitoring zinc concentration in serum, hair and saliva at different stages of pregnancy. The serum and hair zinc concentration showed a significant decline with increasing duration of pregnancy but saliva zinc concentration did not show any particular trend. Mean serum zinc concentration in 1st, 2nd and 3rd trimester of pregnancy was recorded as 102.6, 74.6 and 65.5 mg/dl, respectively while respective values for hair zinc were of the order of 184.9, 180.5 and 165.7 g/kg. The mean serum and hair zinc contents in non-pregnant women were 97.1 mg/dl and 145.5 g/kg respectively. This showed that serum and hair zinc concentrations were better indicative of zinc status of pregnant women.

SLP
OC.4

4. DELALEPIS HAMILTONII AS A NATURAL PRESERVATIVE

VANDANA BHASKARAN and G.SUBBULAKSHMI

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Bombay-400 049

Decalepis hamiltonii belongs to the family Asclepiadaceae and is found in the Deccan peninsula. It is largely used in the south for pickling along with lime or butter milk and its shelf life is more than a year. The volatile principle of the root 4-0 methylresorcylaldehyde has shown bactericidal properties. The study aimed at using the root as a natural preservative in pickles.

The root was pickled in lemonjuice and buttermilk as done traditionally. Three other pickles : lemon, ginger and chilli were made. The samples were analysed for a period of four months for microbial and sensory changes and results compared to the control.

On storage for 4 months, the pickles with root added to it and the pickles kept in the vicinity of the root had considerably lower microbial load than the control. It was surprising to note that butter milk showed no visible signs of spoilage or over fermentation even after storage for months at room temperature. The sensory evaluation showed that addition of the root did not alter the organoleptic properties of the pickles.

Thus it can be concluded that Decalepis hamiltonii has great potential in the food industry as a natural preservative.

SLP OC.5

5. ESTROGEN INDUCED POTENTIATION OF MALATHION TOXICITY IN PREGNANT RATS AND THEIR 21 DAY OLD PUPS

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The effect of Malathion (Mal) (13.78 mg, 27.56 mg and 82.6 mg per 100 gm b. wt. i.g. from 6th to 13th day of gestation), Estrogen (Est) (1 ug per day per 100 gm b.wt.s.c. from 3rd to 20th day per gestation), Progesterone (Prog) (4 mg per day per 100 gm b.wt.s.c. from 3rd to 20th day of gestation, Mal + Est, Mal+Prog, Mal + Est + Prog on hepatic cytochrome p-450 and Acetylcholinesterase (AchE) activity in brain of dams and their 21 day old pups were studied. Hepatic cytochrome p-450 content was found to be significantly elevated by Mal, Est and Mal+Est administration in dams and their pups. In Prog and Prog+ Mal (at low dose) administered dams and their 21 day old pups, there were no significant effect on cytochrome P 450 levels. The inhibition of AchE enzyme activity in brain induced by Mal was potentiated by Est administration. Similar pattern was observed in 21 day old pups also. The results suggest that extraneous Est administration potentiates Mal induced toxicity possibly by its activation to more potent AcehE inhibitor malaoxan by the increased cytochrome p-450 content.

SLP
OC.6

6. DESERT, NUTRITION AND HEALTH

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The problems of deserts and their development have received considerable attention both at International and National Level. Monitoring the human conditions in these areas should address particularly to nutrition, endemic diseases, water quality and immunization status of the inhabitants. In this direction Rajasthan has special significance as majority of its areas lies under arid zone. The districts of Bikaner, Jaisalmer, Barmer, Jodhpur Churu and Sri Ganganagar lie wholly in arid zone. Under extreme climatic conditions of scanty rainfall, poor plantation, very deep water sources and its poor quality, barren land, the inhabitants are forced to live under various constraints. Repeated drought condition adds to the misery.

Efforts has been made to obtain baseline information regarding nutrition and water quality situation in Thar desert to study the impact of development and make projections for future.

18th December 1992

Venue : Foyer - Ground Floor Gopalan Block

Time : 04.00 p.m. - 05.30 p.m.

POSTER SESSION - I : **EXPERIMENTAL NUTRITION**

COMMUNITY NUTRITION

PSP EXP.1

1.SAPONIN CONTENT AND TRYPSIN ACTIVITY OF PEA CULTIVARS (PISUM SATIVUM) : EFFECT OF DOMESTIC PROCESSING AND COOKING METHODS

NEELAM KHETARPAUL and SAROJ BISHONI

Department of Foods and Nutrition CCS Haryana Agricultural University, Hisar-125 004.

Antinutrients including saponins and trypsin inhibitors present in considerable amounts in peas are known to adversely affect their nutritive value. Raw unprocessed seeds of different cultivars of vegetable (Bonneville and Arkel) and field (HFP 4 & Rachna) peas were found to contain 109 to 251 mg/100g saponins and varying amounts of trypsin inhibitors 922.4 to 989.5 TIU/g. Various processing and cooking methods including soaking (6,12 &18h), soaking and dehulling, ordinary and pressure cooking of unsoaked of soaked-dehulled pea seeds and sprouting caused a significant reduction in the content of antinutrients. Germination for 48 h had the maximum saponin lowering effect; loss in saponin content being to the extent of 67 to 84 per cent. Pressure cooking of soaked-dehulled pea seeds was found to be the most effective method for reducing the trypsin inhibitors as it could eliminate 90 to 95 per cent trypsin inhibitor activity.

PSP EXP.2

2. CONTENT OF PHYTIC ACID AND POLYPHENOLS IN PEAS: EFFECT OF PROCESSING AND COOKING METHODS AND VARIETAL DIFFERENCES

NEELAM KHETARPAUL and SAROJ BISHONI

Department of Foods and Nutrition CCS Haryana Agricultural University, Hisar-125 004.

Four varieties of vegetable (Bonneville; Arkel) and field peas (HFP ; Rachna) were analysed for the phytic acid and polyphenol contents. Among the vegetable and field pea cultivars, Arkel and Rachna had higher content of phytic acid i.e. 651.6 and 780.3 mg/100g, respectively. Field pea varieties had higher amount of polyphenols than those of vegetable peas. Different processing and cooking methods viz, soaking, dehulling, germination, ordinary and pressure cooking of unsoaked, soaked or soaked-dehulled pea seeds could bring about a significant reduction in these antinutrients but germination at 30 °C for 48 h had a drastic lowering effect. Phytic acid and polyphenols were eliminated to the extent of 83 and 96 percent, respectively from the peas.

PSP EXP.3

3. EFFECT OF FERMENTATION ON HCL-EXTRACTABILITY OF MINERALS FROM RICE-DEFATTED SOY FLOUR BLEND

RAKHI GOYAL and NEELAM KHETARPAUL

Department of Foods and Nutrition
Haryana Agricultural Unviersity
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Buttermilk fermentation at 25,30 and 35 °C for 12,18 and 24 h brought about a significant increase in non-phytate and HCl-extractable phorphorus with a corresponding decline in phytate phosphorus of rice-defatted soy flour blend mixed in 50:50 proportion. The HCl-extractabilities of calcium, iron, zinc, copper and manganese from the rice-defatted soy flour blend also improved. Higher HCl-extractability of minerals may be partly ascribed to the decreased content of phytic acid as a significant negative correlation between the phytic acid and HCl-extractability of dietary essential minerals was obtained.

PSP EXP.4

4. CHEMICAL COMPLOSITION OF SOME SEED OILS OF VIDARBHA REGION

A.M.MOHARIL, S.K.SAHA, P.B.SHINGWEKAR, A.S.KULKARNI, R.R.KHOTPAL and H.A.BHAKARE

Department of Oil Technology
Laxminarayan Institute of Technology
Nagpur Univesity, Nagpur-440 010

Oils from seeds such as Zizyphus jujuba, Melia Azedarch, Dalbargia sissoo and Sorghum dochna were analysed for their chemical composition and fatty acid composition by GLC. The oils had had acid value of 6.9, 8.2, 9.3, 7.8, iodine values of 97.2, 133.7, 130.8, 119.2, saponification values of 197.7, 203.3, 204.3, 192.7 and unsaponifiable matter contents of 1.6, 3.6, 3.6 and 3.9% respectively. The fatty acid composition showed the major fatty acids to be palmitic, stearic, oleic and linoleic acids. The oils had good nutritional quality indices.

PSP EXP.5

5. COMPARATIVE STUDY OF RECIPES PREPARED WITH KESARI DAL (L.SATIVUS)

M.R. DAMLE and S.M.VIDYA

Post Graduate Teaching Department of Home Science
Nagpur Univesity, Nagpur

Lathyrus sativus or Kesari Dal is a natural pulse which has been the staple food of low income group in many parts of Madhya Pradesh, Bihar, Uttar Pradesh and Maharashtra. The pulse is grown easily with minimum efforts, is least expensive and contains a high amount of good quality protein as compared to other edible pulses, but, due to the toxin present in this dal, Government of Maharashtra has banned its use. The acceptability and chemical analysis of the four different recipes namely Cauliflower Greens French Rolls, Fenugreek Leaves Sabji, Coriander Leaves vadi and Rajgeera Greens Paratha were undertaken keeping Besan recipes as standard. The results of the acceptability trials showed that the recipes prepared with Kesari Dal were comparable with the traditional recipes prepared with Besan. The moisture content ranged between 26.4 gm% to 53.6%, the ash content was in the range of 3.07 to 7.37 and the iron content was found to be between 3.54 to 10.47 gm% whereas the protein content of the recipes ranged between 9.0 to 16.0 gm%. Hence, Kesari Dal with higher protein content at lower cost can be successfully utilised for the preparation of our traditional recipes.

PSP EXP.6

6. MICROBIOLOGICAL STATUS OF GROUND NUT OIL AND SOYA BEAN OIL IN DELHI MARKET

PRASHANT DUTT and I.CHAKRABORTY

Foods Research and Standardisation Laboratory
Ghaziabad

Microbiological status of ground nut and soyabean oil samples purchased from local market in Delhi was studied with special reference to lipolytic and pathogenic microorganisms. A total of 56 oil samples of ground nut and 35 samples of soyabean oil examined. All unrefined samples of both oils were found contaminated with microorganisms. The predominent pathogenic organisms were Aspergillus flavus, Staphylococcus aurens and Bacillus Cereus. The lipolytic organisms were A.Niger, Penicillium sp., Micrococcus luteus.

PSP EXP.7

7. NUTRITIONAL EVALUATION OF SAG PREPARED FROM BATHU (CHENOPODIUM ALBUM), CARROT (DAUCUS CAROTA) AND RADISH (RAPHANUS SATIVUS) LEAVES

BALWINDER SADANA and GEETA LUTHRA

Department of Foods and Nutrition
Punjab Agricultural University
Ludhiana-141-004

Sag, a traditional leafy vegetable preparation of Punjab was prepared from Bathu, Carrot, Radish and Spinach leaves. Recipes namely B1 - Bathu sag, B2-Bathu + Spinach sag (2:1), C1 - Carrot sag, C2 - Carrot Spinach sag (2:1) R1 - Radish sag, R2 Radish + Spinach Sag (2:1) and S1 - Spinach sag were developed. Spinach sag was kept as a control. Sensory evaluation of cooked recipes revealed that R2 was found to be the most acceptable followed by B1 and B2 respectively. Dried samples of sags were analysed for various nutrients. These greens were found to be cheap and rich sources of ascorbic acid (53-278) mg and B-carotene (3178-21750 ug/100 g). Calcium, iron and phosphorus content of cooked preparations ranged from 246-840, 22-76 and 82-118 mg/100 g, respectively. Among the experimental recipes maximum lysine was found in Bathu sag (606 mg/g N) while the highest values for tryptophan (90 mg/g N) and methionine (140.6 mg/g N) were found in Radish sag.

PSP EXP.8

8. SUPPLEMENTARY VALUE OF BATHU (CHENOPODIUM ALBUM) CARROT (DAUCUS CAROTA) AND RADISH (RAPHANUS SATIVUS) LEAVES TO WHEAT CHAPATI

BALWINDER SADANA, GEETA LUTHRA and SUKHWANT MANN

Department of Foods and Nutrition
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The supplementary effect of sags (cooked greens) of bathu, carrot, radish and spinach on the protein quality of wheat chapati was observed using protein efficiency ratio (PER) and chemical score methods. Diets were prepared by mixing bathu, radish spinach (2:1), carrot + spinach (2:1) and spinach sags separately to the wheat chapati in the ratio of 1:4. Protein content of all diets was maintained at 10% level. Diets were fed to the weanling rats for four weeks. Supplementation of sags improved the PER of wheat chapati from 1.04 to 1.38, 1.19, 1.15 in bathu, carrot + spinach and spinach supplemented groups. Among the experimental diets PER, plasma protein, total liver weight and per cent liver nitrogen was found to be maximum in wheat chapati + bathu sag diet fed group. Chemical scores of lysine of wheat chapati improved from 37 to 57 and that of methionine from 49 to 53 when supplemented with sags. The study shows that these sags can be supplemented to cereal diets with beneficial effects.

PSP EXP.9

9. NUTRITIONAL EVALUATION OF FOUR NEW VARIETIES OF KIDNEY BEANS (PHASEOLUS VULGARIS)

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Punjab Agricultural University
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The nutritional evaluation of four new varieties of Phaseolus vulgaris viz. PDR-14, PDR-27 and VL-63 was done. The crude protein content of new varieties and common beans ranged from 21.07 to 25.60 g/100 g DM. The methionine cystine and tryptophan content of all the varieties ranged from 0.97 to 1.60 gN, 0.64 to 0.76 g/16gN and 0.86 to 1.05 g/16gN respectively. The calcium, iron, copper and zinc content of all the varieties varied between 145 to 157 mg/100g sample, 1.01 to 1.76 mg/100g sample and 2.75 to 3.43 mg/100g sample respectively. Cooking helped to reduce the maximum trypsin inhibitor activity in all the varieties as compared to soaking and sprouting. Hemagglutinin activity was totally destroyed by cooking and sprouting in all the varieties. Growth rate of rats fed on all the experimental diets was very poor as compared to skim milk diet. PDR-14 had maximum value for protein efficiency ratio. PDR-27 was the best variety from cooking quality point of view whereas PDR-14 was the best variety among the new varieties from its nutritional point of view.

PSP
EXP.10

10. ASSOCIATION OF THE SOY RABADI ANTINUTRIENTS WITH CALCIUM AVAILABILITY (IN VITRO) - AN INDIGENOUS FERMENTED FOOD

B.M.CHAUHAN and RAJ BALA GREWAL

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CCS Haryana Agricultural University
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Soy rabadi was prepared from autoclaved dehulled soybeans and curd by fermenting the homogenous mixture at 25,30 and 35 C for 12, 24 and 48 h.Unfermented rabadi mixture contained lower concentration of phytic acid, saponins and polyphenols and possessed better calcium availability (in vitro) as compared to raw soybean (37%). As fermentation progressed, level of phytic acid and saponin further reduced and calcium availability (in vitro) increased significantly. Rabadi fermented at 35 C for 48 h. had lowest concentration of phytic acid (489 mg/100 g) and saponin (974 mg/100 g) and highest calcium availability (51%). The increase in calcium availability during the indigenous fermentation may be attributed to the reduction in level of these antinutrients as negative and significant relationship was found to exist between calcium availability and the latter.

PSP EXP.11

11. ANTINUTRITIONAL CONTENT OF DEVELOPED WEANING FOODS AS AFFECTED BY DOMESTIC PROCESSING

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Breast milk contains most of the nutrients in appropriate proportion required to maintain growth upto six months. Subsequently, supplementary feeding has to be resorted to in order to maintain the expected rate of growth of infants and to bridge the gap of energy and protein requirement. With this aim four weaning foods were formulated using locally available cereals and pulses such as wheat (Triticum aestivum), barley (Hordeum vulgare), green gram (Vigna radiata). Cereals and pulses were used in the ratio of 7:3. The effects of domestic processing like roasting and malting on the antinutrients like phytic acid, saponin and polyphenols of weaning foods were studied. Roasting of raw ingredients resulted in 38.87 to 40.75%, 44.75 to 48.62% and 48.41 to 50.97% decrease in phytic acid, saponin and polyphenols, respectively, whereas malting brought about 56.58 to 57.56%, 53.94 to 57.65% and 61.20 to 62.71% decrease in phytic acid, saponin and polyphenols, respectively. Thus, the study indicated that malting had pronounced effect in lowering the antinutrients, while roasting was relatively less effective.

PSP EXP.12

12. NUTRITIONAL QUALITY OF HCl - TREATED PALM KERNEL PROTEIN

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The effect of hydrochloric acid treatment for dehulling of palm kernel on the nutritional quality of its protein was studied and compared with that of untreated kernel protein and casein. Rats fed with treated defatted kernel flour diet showed similar gain in body weight when compared to those fed casein diet, while the gain in body weight in the animlas fed untreated kernel flour was lower. The PER of the treated flour was 95% of that of casein while that of the untreated flour was lower. In the case of treated flour diet, 80% of food nitrogen was absorbed compared to 94% in the casein and 65% in the case of untreated flour indicating improvement in the protein digestibility on HCl treatment. The essential amino acid content was comparable in the case of egg protein and the treated kernel flour. Available lysine content was higher in the treated sample compared to that of the untreated sample.

PSP EXP.13

13. STARVATION INDUCED CHANGES IN THE SITES OF METHIONINE UPTAKE IN LACTATING MOUSE MAMMARY GLANDS

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Starvation induced changes in the sites of methionine uptake by mammary glands from lactating mice were studied in vitro. Using the specific A system inhibitor N-(methylamino) isobutyric acid (MeIB) and specific L system inhibitor, 2-amino-bicyclo (2.2.1) heptane 2- carboxylic acid (BCH), we were able to define four modes of methionine entry into mammary gland tissue, (i) A sodium-dependant A system with a Vmax of 18.8 n mole/g cell/min and a Km of 0.47M; this mode of entry was completely inhibited by MeAIB. Starvation of mice for 2 days increased the Vmax to 37 n mol/g cell/min and Km to 1.05mM. (ii) A sodium-dependent mode with a Vmax of 12.4 n mol/g cell/min and a Km of 0.46 mM; this mode of entry was insensitive to inhibition by MeAIB. The V max and the Km of this mode increased to 136.8 n mol/ g cell/min and 5.68 mM, respectively, in starved mice. (iii) A sodium-independent L system with a Vmax of 30 n mol/g cell/min and a Km of 0.46 mm: this mode of entry was completely inhibited by BCH. The Vmax of this mode decreased to 24.8 n mol/g cell/min and the Km was not affected by starvation. (iv) A residual, but substantial, sodium-independent entry which was not inhibited by high

concentration of MeAIB and BCH. These results show an adaptive increase in the two sodium-dependent modes of methionine entry into mouse mammary glands as a result of starvation.

PSP CN.1

1. ACCEPTABILITY AND VISCOSITY OF LOW COST HOME PROCESSED MIXES DEVELOPED FOR PRESCHOOLERS

SAROJ DAHIYA and A.C. KAPOOR

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CCS Haryana Agricultural University
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Low cost ready to eat food supplement mixtures were prepared using locally available foods including wheat, pearlmillet, bengal gram, green gram, groundnut and amaranth leaves. Bengal gram and green gram were malted. Wheat, pearlmillet and groundnuts were roasted. Malting involved soaking of pulses for 12 h followed by sprouting for 24 h and 48 h, drying at 70 °C for 2 h to develop malt aroma. These malted grains were roasted, milled along with roasted cereals. The flour thus obtained and jaggery were blended thoroughly. The ingredients were mixed in the proportion of 40:10:10:10:40 wt/wt in all the blends. All supplements could meet one third requirements of protein, energy, iron and calcium for preschool children. Malting significantly reduced the hot paste viscosity of the products ($P<0.05$) and increased nutrient density per unit volume in all the preparations. Sensory evaluation study revealed that taste, texture, colour, aroma of all supplements were found to be excellent with mean scores of overall acceptability (9.77, 9.33, 9.11 and 8.75) for supplement I, II, III & IV, respectively. Children did not develop any GIT disorders after consuming the products. Trained panelists found all the products, well acceptable and tolerable as indicated by

Nine Point Hedonic Scale. The study suggests that these home processed mixes serve as good supplements for improving nutritional status of young children of low socio-economic group.

PSP CN.2

2. MALNUTRITION AMONG TRIBALS - ANTHROPOMETRIC RESULTS

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From Junnar and Dhule Tribal areas covering Mahadeo Koli (M-388 F-155) Pawara (M-72 F-38) and Bhil (M-65 F-17), children ranging from 5-15 years age range were subjected for anthropometric assessment. Variables included were anthropometry, socio-economic information and environmental factors. The main aim was to assess the nutritional status based on anthropometry and the influence of other factors on it.

Each individual's body measurements when compared with the percentile standards of well-off children, showed gross malnutrition.

Poverty, low economic status, and therby low buying power of essential commodities resulting were factors responsible, in stereotype type of diet lacking in essential nutrients. Besides these direct factors, the indirect ones such as the deforestration of the area and/or low availability of cultivable land restrictions by the various Government agencies on the use of land, different kinds of pollution (such as water, sound, air), invasion of non-tribal's traditions, customs, beliefs, fashions, communications etc. influenced more on the tribal's way of life. These soft core cultural factors may be responsible for gross malnutrition.

These results need to be checked on a large sample size covering the whole Tehesil and for a long duration.

PSP
CN.3

3. ASSESSMENT OF THE NUTRITIONAL STATUS OF PRE-SCHOOL CHILDREN (3-6 YEARS) OF WORKING MOTHERS

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Seventy children equally representing nuclear families with working and non-working mothers in the middle income group were studied to determine the impact of the maternal employment on the nutritional status of the pre-school children (3-6 years). The working mothers spent more than 5 hours at the place of work. Random purposive sampling was carried out with the help of screening forms to select the subjects, both boys and girls. A schedule was used to collect the data. Anthropometric data revealed normal growth in all children; values were comparable to ICMR but below NCHS values. Intakes of energy, iron and niacin were lower than the RDA for the children, although the intakes of other nutrients were comparable. However, the nutrient intakes were higher for girls but were not significantly different. Incidences of dental caries, measles, chicken-pox and diarrhoea were reported. Conclusively, the working status of the mothers was not found to have any significant effect on the nutritional status of the children even on keeping the fathers income and the type of family constant, as the family income, excluding that of the mothers, was found adequate for the family needs.

PSP CN.4

4. THE INTAKE AND PREVALENCE OF VITAMIN A DEFICIENCY AMONG CHILDREN (6-12 YEARS) BELONGING TO LOW SOCIO-ECONOMIC GROUP IN JAIPUR CITY

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Vitamin A undernutrition is a global health problem and is the major cause of preventable childhood blindness. Seventy five primary school children formed the target group of the study. Low percapita income, a large family, high dependency ratio, low purchasing power and low educational background of the parents were a few characteristics of the families surveyed. The average nutrient and food intake was a mere 50% of the RDA. Intake of vitamin A was only 58% of the RDA, not taking into account the faulty cooking practices followed by the families. This 58% i.e. 349 ug was contributed by retinol (55%) and carotene (45%). Negligible consumption of milk, leafy vegetables and fruits was revealed during the survey. Ten percent families did not cook leafy vegetables whereas 17% children did not eat any leafy vegetable. Night Blindness was detected in 29.33% children at the Light Stress Test. Clinical Examination presented 33.33% children with pale conjunctiva and 16% children with Bitot's Spot.

PSP
CN.5

5. A STUDY OF DIETARY ZINC INTAKE OF PREGNANT WOMEN

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A study was conducted on 90 pregnant females in their last trimester of their pregnancy. The main aim was to assess their zinc intake and simultaneously find out their general nutritional status. The mean zinc content (534 ± 379 mg/d) of their diet came out to be quite high when compared to the RDA (20 mg/d). The zinc intake of vegetarians (571 mg/d) and non-vegetarians (548 mg/d) was not very different, although the values were slightly high in vegetarians. The consumption of calories, proteins, iron and fibres were much below the RDAs. Pica was found in only 15.5% of the pregnant females and the previous deliveries of most subjects was normal.

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PSP
CN.6

6. A COMPARATIVE STUDY OF THE FOOD BELIEFS, HABITS AND PATTERN AND INCIDENCE OF DIET RELATED DISEASES IN HOUSEWIVES OF TWO COMMUNITIES

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A study was conducted to compare the food beliefs, habits and pattern and incidence of diet related diseases in 35 Punjabi and 35 Jain housewives. Wide variations were found in the food beliefs of the two communities. Observations revealed that Jains avoided non-veg. foods, roots and tubers, green leafy vegetables and had their evening meal before sunset, which were not the characteristics of the Punjabi community. Both the housewives believed in 'hot', 'cold ', 'light', 'heavy' foods. Habits like eatingout, eating fried snacks and nibbling between meals was common in both the communities. Fasting was more rigidly followed by Jain housewives as compared to Punjabi. More faulty cooking methods were followed by Jain housewives which could be because of less education and awareness about good food and diet related diseases. Frequency of consumption of various food groups was found was found to be similar in the two communities. However, fat consumption was found to be more in Punjabi housewives. The intake of proteins and calories was comparable in both the communities. Anthropometric measurements were much above the standards and incidence of diseases like obesity and high blood pressure was more in Punjabi housewives and that of GIT disturbances in Jains.

PSP
CN.7

7. DIETARY INTAKE OF ZINC, COPPER AND IRON IN YOUNG COLLEGE STUDENTS

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Dietary zinc, copper and iron intakes of 19 men and 11 women (18-25 years) were determined during three periods for 5 consecutive days each, using weighment method and chemical analysis of food samples. Daily zinc, copper and iron intakes of men ranged from 13.1 ± 1.1 to 15.3 ±1.4 mg/d, 1.62±0.15 to 1.84± 0.17 mg/d and 20.5 ± 2.8 to 29.1 ± 4.5 mg/d and of women 8.8 ± 2.- to 9.0 ± 1.6, 1.42 ± 0.23 to 1.69 ±0.62 and 10.0 ± 2.4 to 14.7 ± 2.6 mg/d respectively. Cereals provided 67.7% of dietary zinc, 47.7% copper and 62% iron in men and 60% of Zn, 44% of Cu and 59% of Fe in women, suggesting less contribution of cereals to Cu intakes than Zn and Fe. Men had their mineral intakes close to the recommended allowances for Indians, while intakes of women were 30 to 60% deficient. When expressed as mg/1000 Kcal, lower calorie intakes of women were responsible for their low mineral intakes. Intra individual variation in mineral intakes was higher (18-39%) than that of energy intakes (14-17%) in both men and women. Phytate : Zn molar ratios were > 15 indicating risk of zinc deficiency in these students.

PSP
CN.8

8. BREAST FEEDING TRENDS AMONG MOTHERS IN CHANDIGARH

MADHU SHARMA

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Postgraduate Institute of Medical Education & Research
Chandigarh

One hundred ninety eight mothers of children in the age group 6 months to 3 years from the urban and semi urban population of Chandigarh attending the out patient services of PGI were assessed for the impact of literacy level and socio economic status on the pattern of breast feeding. Exclusive breast feeding was done by 19.7% of mothers beyond 1 year by non graduate or illiterate mothers against 3% of graduate mothers. 78.94% of non graduate mothers continued breast feeding beyond 1 year compared to 51.63% of graduate mothers. The duration of breast feeding was longest by mothers belonging to lower income group (63%) and it decreased with the rise of status from middle income (53.7%) to high income group (46.6%). Higher the income and literacy level, greater was the percentage of mothers (36.6% of high income group, against 23.8% middle income group and 10% lower income group mothers and 27% of graduate against 13.15% of non graduate) who started top feeds along with breast feeds right from birth. It was found that socio economic status and literacy level significantly correlated with the breast feeding trends among mothers in the urban and semi urban population. With the rise in income and literacy levels more mothers conformed to the desired practices of breast feeding.

PSP
CN.9

9.MOTHERS' DEALING REGARDING CHILDHOOD DIARRHOEA

DIPTIMAYEE JENA

Krushi Vigyan Kendra
Keonjhar

Role of ORS or home made fluid is well accepted unless the mother knows exactly how to deal the problem of childhood diarrhoea. Two communities, one remote village of Orissa and a peri-urban village of U.P. were studied for comparison in maternal practice towards childhood diarrhoea. It was observed that some mothers go exclusively for medicine in both Orissa (55.6%) as well as in Uttar Pradesh (59.2%). Exclusively ORS was prefered in 6.7% mothers of Orissa and none in the study village of U.P. In both areas, people go for liquid diet (40%). Restriction of food is similar (38%) in both areas followed by liquid diet is 40% approximately. Unhygienic practice, washing of utensils in 'Sanana'and 'Pond' was in 45.8% and 24.3% in U.P. and Orissa respectively.

So does the mother need more effective way of health education ? or Does our message need modification ?

PSP
CN.10

10. IRON SUPPLEMENTATION DURING PREGNANCY - EFFECT OF SIDE-EFFECTS AND SOCIO-CULTURAL FACTORS ON COMPLIANCE

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It has been well documented that despite various attempts, the prevalence of nutritional anemia continues to be high among pregnant women. Iron supplementation studies to-date have studied the haematological changes and few have investigated the problems related to compliance. The present study was carried out in the urban slums of Baroda on 100 pregnant women, who were supplemented with different dose levels of iron (60, 120, 180 mg) and 1.5 mg folate from the 20th week of gestation till delivery. Problems and perceptions with regard to consumption of iron supplements were recorded at monthly intervals through unstructured interviews and observations. Several factors such as obstetric history, educational level, intra and interhousehold influences, severity of anaemia, side-effects, frequency of contact with health personnel, type of packaging of the tablets, are seen to affect compliance. These and the effect of dose levels on compliance will be addressed in this paper.

PSP
CN.11

11. DEVELOPMENT OF AN AMYLASE RICH FOOD FROM BUNTI (ECHINOCHLOA STAGNINA) AND ITS EFFECTIVENESS IN THE PREPARATION OF LOW BULK WEANING GRUELS

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An aspect recently emphasized in the etiology of PEM and studied mainly in connection with weaning foods is the concept of dietary bulk and its importance to child feeding. Malting has emerged to be the best process with respect to reduction in viscosity. The present study was carried out to study the malting properties of Bunti, an unconventional millet cultivated and consumed extensively by Tribal populations. Bunti amylase rich food (ARF) with optimum amylase activity could be developed by steeping for 24 hours and germinating for 36 hours followed by oven/sun drying, devegetating and milling to a fine powder. Viscosity of hot paste slurries prepared from Bunti flour at different solid concentrations (10,15,20 and 25%) ranged from a thin free flowing gruel to dough-like in nature. Additional of Bunti ARF (1-7% level) to the slurries indicated a maximum reduction of viscosity at 4% level of ARF. Sun-dried and oven-dried samples could be safely stored for a period of 30 days without drastic deteriorative changes in any of the storage parameters (moisture content, alcoholic acidity, amylase activity and organoleptic testing).

PSP CN.12

12. IMPACT OF NUTRITION EDUCATION AND MEDICAL SUPERVISION ON THE ANTHROPOMETRY OF RURAL PREGNANT WOMEN AND THEIR NEONATES

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College of Home Science
Punjab Agricultural Univesity
Ludhiana

Sixty six Punjabi women from low and lower middle income groups were selected from eight villages of Ludhiana District. The supplements of iron, folic acid and calcium in the form of folifer and calcium tablets were regularly supplied to Experimental (E) group from II trimester (trim) onwards. A pamphlet about the diet during pregnancy was distributed to the E group along with four individual and three group contacts during the second half of pregnancy. The control (C) group was provided iron folate supplements as per government practice. Body height, weight, mid-upper-arm circumference (MUA) and skinfold thickness of the subjects were recorded. Weight gained during pregnancy and post partum weight were also recorded, while Body Mass Index, Weight, Height Ratio Indiex (WHRI), Weight Height Product Index (WHPI) were calculated. In addition, Crown Heel Length (CHL), Birth Weight (BW), skinfold thickness, MUA, Head Circumference (HC), Chest Circumference (CC) and Ponderal Index (PI) of the neonates were recorded within eight hours of their birth. The gain in weight during pregnancy was 6.30 and 5.7 kg in E and C groups respectively. The study revealed that BW, CHL, skinfold thickeness and PI of the newborns were significantly

($P<0.01$) higher in E group. The mean BW of newborns in E and C groups was 2700 and 2300 g respectively. Weight gained during pregnancy had significant ($P<0.05$) correlation to MUA, BW and skinfold thickness of the newborn.

PSP CN.13

13.DIETARY INTAKE AND IRON STATUS OF SCHOOL GIRLS

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The study was conducted on one hundred and twenty school girls (13-15 years) of four Government schools of Ludhiana city. They were classified into three groups on the basis of their family income i.e. income (IG) I, Income group II and income group III consisting of 38,44 and 38 subjects respectively. The mean daily intake of cereals, pulses, vegetables, fats and sugar among the subjects of all the groups was inadequate while the intake of fruits, animal foods and milk was, however, almost adequate in all the groups. The mean pulse consumption of the subjects in IG III was significantly higher ($P<0.05$) than IG I, whereas the difference in fruits, milk and milk products, sugar and jaggery, fats and oils consumption of the subjects of IG II and IG III was significantly higher ($P<0.05$) than those of IG I. The mean dietary energy, protein, iron and ascorbic acid was inadequate while the intake of copper and fibre was adequate. However, there was no significant difference in energy, protein, iron and copper intakes among the subjects of three groups. The fibre intake by the subjects of IG I was significantly higher ($P<0.05$) than the subjects of IG III whereas the intake of ascorbic acid by the subjects of IG II was significantly higher ($P<0.05$) than those of IG I

and IG III. The haemoglobin (Hb) level of all the subjects ranged from 8.5 - 12.5 g/dl while the mean value in IG I was 10.83 g/dl, in IG II was 10.74 g/dl and IG III was 10.58 g/dl which was below the standard value. This can be attributed to the low intake of green leafy vegetables, pulses and cereals.

PSP CN.14

14. EFFECT OF NUTRITION EDUCATION IN THE CONTROL OF NON - INSULIN DEPENDENT DIABETES MELLITUS

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Diet being the corner stone for treatment of non-insulin dependent Diabetes Mellitus, lack of nutrition education to patients by doctors and dietetian hinders the path for successful treatment. Thirty newly detected male NIDDM patients were selected to study the effect of nutrition education in its control. Initially, the anthropometric measurements, blood parameters, the nutrients intake by 24 hour recall method were recorded and a knowledge test conducted. Thereafter intensive nutrition and diabetic education was imparted twice within a period of 20 days through personal interviews and dietary counselling using handouts on exchange lists and low calories and high fibre diets. After forty days, dietary intake, anthropometry, blood parameters and gain in knowledge was assessed again. The results indicate a significant increase in nutrition and diabetic knowledge score (7.05 to 21.03 out of 31) and decrease in weight (74.06 to 73.26 kg) intake of oral hypoglycaemic drugs (0.98 to 0.58 tablets/day), fasting and post prandial blood glucose levels (166.83 to 103.03 and 262.91 to 156.53 mg/dl) total cholesterol (207.90 to 200.33 mg/dl) and total triglycerides (202.56 to 189.90 mg/dl). Nutrition education

helped to improve the diabetic state. However, it was observed that if intensive education is not given regularly the patients are apt to return to their old eating habits.

PSP CN.15

15.IODINE INTAKE IN A GOITRE ENDEMIC AND A NON-ENDEMIC AREA OF PUNJAB

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Ludhiana-141-004

Dietary deficiency of iodine is one of the major causes of endemic goitre. To study the intake of iodine and its correlation with prevalence of goitre, epidemiological survey was undertaken. On the basis of this survey, food intake of 60 school children (10-12 years old), 30 each from a selected goitre endemic and a non-endemic area of District Ludhiana, Punjab, was collected for one day each in summer and winter separately by duplicate sampling technique. Iodine content was determined by Kinetic Assay method. The Mean $\pm$ SD of daily intake of iodine from diet (food and water) and food alone by children in endemic area was 93.64$\pm$31.62 ug and 84.87$\pm$30.88 ug and non-endemic area 114.47$\pm$30.38 ug and 92.66 $\pm$ 27.65 ug respectively. The intake of iodine from food by children consuming non-iodized salt was 52.33$\pm$12.35 ug and 72.61$\pm$14.68 ug in endemic and non-endemic areas respectively ($P<0.01$). The goitre prevalence in endemic area was 46.7% and in non-endemic 11.6%. Thus a significant inverse correlation ($P<0.01$) was established between iodine intake and prevalence of goitre.

PSP CN.16

16. STORAGE STUDY ON READY TO EAT PRODUCTS OF BAJRA USING DIFFERENT TYPES OF CONTAINERS

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Bajra is consumed as staple food among poor people. It has high concentration (5%) of fat as compared to other cereals, pulses and lentils. Addition of sago and rice to bajra flour increases its binding properly. Biscuits, meshed products and extrudent products were prepared from bajra flour mixed with sago, rice and blends of different pulses, thus increasing its taste and nutritional value. The shelf life of these products was observed by storing them in five different types of containers including glass, tin and polyethylene bags of 200 and 400 guage. Proteins, carbohydrates and free fatty acids were analysed. Weekly sensory evaluation was carried out by the panel of five judges on prescribed proforma. All types of containers showed safe shelf life from 3 to 4 weeks. The cost of 200 guage is minimum but it does not have long life. Glass containers gave best results but economically they are not suitable; 400 guage PE bags were found to be best considering all the parameters. There could not be found much variations in nutritive values except changes in free fatty acid content. This can be assumed that quality of products deteriorate by oxidation of fats present in the products and not by microbial load. It was concluded that all bajra products can be stored upto four weeks period in

400 PE bags at room temperature (25-30°). However, they can be stored up to five weeks in glass containers.

PSP CN.17

17. KNOWLEDGE AND PRACTICES ABOUT CONSUMPTION OF IODIZED SALT AMONG RURAL FAMILIES OF KANGRA DISTRICT (H.P.)

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*College of Home Science, HPKV,Palampur
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It is proposed to iodize all edible salt by 1993 and the Himachal Government has banned the sale of non-iodized salt. The present study was, therefore, conducted on fifty rural families of Kangra district, to get information related to the use of salt type, brand, frequency of use, awareness about its use and storage etc. The results show that 48% of the families used iodized salt, 38% rock salt and the remaining (14%) both rock and iodized salt. The most popular brands of salt used were Tata and Ashoka, whereas other brands consumed were Lalgulab, Neelkamal and Deepak. The maximum proportion (39%) of the families was using iodized salt for more than 5 years followed by 23% families for the last 2-3 years. Most of the families became aware of it as it was avaiable in the market. When asked the reason for using iodized salt, 23% reported it to be good for health, 35% easy to use, 16% the only alternative and 19% used it without any reason. Sixteen percent of the families not using iodized salt found it expensive, 47% being unaware of its advantages and the remaining 37% did not give any particular reason for not using iodized salt. The salt was stored in different types of containers like earthern, metallic, wooden, plastic and in polythene bags as such

procured from the market. The maximum percent (42%) of children's families stored salt in earthern pots with lid, followed by 32% in plastic containers.

PSP
CN.18

18. SEASONAL VARIATIONS IN FOOD INTAKE BY PRIMARY SCHOOL CHILDREN OF KANGRA DISTRICT (HP)

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The study was undertaken on fifty primary school children (25 boys and 25 girls) of rural areas of Kangra district. The quantity of food consumed was recorded for three consecutive days by 24 hr recall method. The total food intake by boys in winter was (517.68 $\pm$19.13 g.d.$^{-1}$) significantly more ($P<0.001$) than in summer (425.29 $\pm$ 21.65 g.d.$^{-1}$). The girls also consumed more quantity of food in winter (500.69 $\pm$ 24.34 g.d.$^{-1}$) that in summer (484.78 $\pm$24.56g.d.$^{-1}$) with no significant difference. The consumption of all the food groups both by boys and girls was more in winter than that in summer except for other vegetables. The intake of all the food groups in summer when expressed as percent suggested intakes by ICMR was more in girls than that in boys. In winter, the intake of cereals, pulses, green leafy vegetables, other vegetables, roots and tubers was more by boys than that by girls and consumption of milk and milk products, fats and oils was more in girls than in boys with the exception of sugar and jaggery the intake of which was the same both in case of boys and girls. In both the seasons, boys and girls consumed roots, tubers and other vegetables in excess amounts than the suggested allowances whereas the consumption of remaining food groups

PSP CN.19

19. PROTEIN AND STARCH DIGESTIBILITY AND IRON AVAILABILITY IN DEVELOPED WEANING FOODS AS AFFECTED BY ROASTING

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Locally available cereals and pulses such as rice (*Oryza sativa*), Kangini (*Setaria italica*), sanwak (*Echinochoa frumentacea*), green gram (*Vigna radiata*) and jaggery were used to formulate three weaning foods. Cereal, pulse and jaggery were mixed in the ratio of 70:30:25. Roasting was the main processing technique used in the formulation of these weaning foods. The developed weaning food were found to be economical and acceptable. Moisture, protein, ash, fat, iron, crude fibre and calorie content of weaning foods ranged from 5.06 to 5.68 g, 10.28 to 13.70 g, 2.91 to 3.7 g, 0.82 to 1.87 g, 14.42 to 15.53 mg, 1.03 to 1.27 and 357 to 374 Kcal per 100 g respectively. Chemical composition of developed weaning foods was within the range prescribed by Indian Standard Institute (ISI). On roasting, Indian protein and starch digestibility of weaning foods increased by 15 to 21% and 16 to 19% respectively. Roasting also improved iron availability by 12 to 19%. These observations indicated that the weaning foods prepared from locally available food ingredients resulted in significant improvement in protein and starch digestibility and iron availability and could be used as supplement for meeting the nutritional requirements of infants.

PSP
CN.20

20. PREVALENT FOOD CONSUMPTION PRACTICES AMONG URBAN PREGNANT WOMEN OF HISAR DISTRICT

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A survey carried out in 115 families revealed that pregnant women had an average knowledge about the increased nutritional requirements during pregnancy. The main sources of their knowledge regarding nutrition were TV, radio and family members. Their dietary pattern revealed tht the consumption of fruits and green leafy vegetables was very low. On the whole, their intake of calories, protein, calcium, iron and vitamin A was less than that of recommended allowances. The respondents of middle and high income groups kept good hygienic conditions in their kitchen, whereas the subjects belonging to low income group were having poor hygienic conditions in their places of cooking. Majority of the subjects under study was using aluminium and steel wares for cooking but they preferred to use pressure cooker for cooking. The cooks were employed by the families belonging to higher income group only.

PSP CN.21

21. USE OF LATHYRUS PROTEINS FOR SUPPLEMENTATION OF COOKIES

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Nagpur

Lathyrus sativus or khesari dhal is cultivated and consumed mainly in central India. The legume is highly resistant to drought and survives when other crops fail. It contains a toxic factor causing lower limb paralysis, when consumed as the staple for prolonged period. Symptoms are generally not observed when legume was consumed along with cereal. The toxic factor is identified as BOAA. Lathyrus S contain 29.3% protein and present study describes the possibility of using lathyrus protein for supplementation of cookies. Lathyrus flour was incorporated at 10 and 20% level in cookies. It was observed that the spread factor, grain structure and density was comparable with control. Sensory qualities particularly flavour and texture were judged as superior to control. However, the toxic compound i.e. BOAA was not destroyed during baking and hence Lathyrus flour as such cannot be recommended for supplementation of cookies. Protein Isolate (PI) was prepared from Lathyrus flour by isoelectric precipitation. The PI content was 91.6% crude protein on dry weight basis and recovery of protein was 64%. PI was shown to be copletely free from BOAA when examined by TLC. PI was incorporated at 2 levels in cookies to achieve final protein content between 8 to 10%. The spread factor and density was found to be comparable with control. In sensory evaluation taste and texture of test sample was

found to be superior to control but the flavour was adversely affected at higher level of incorporation.

PSP CN.22

22. NUTRITIONAL STATUS OF GIRLS (18-21 YEARS) STAYING IN BACKWARD CLASS GIRLS HOSTEL OF AMRAVATI CITY, MAHARASTRA

ASHA MANE* and SURYAKANTA AMZARE**

*College of Rural Services, Amaravati
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Amaravathi

To assess the nutritional status of girls staying in backward class girls hostel of Amaravati City, Maharashtra, a sample of 73 girls aged 18-21 years was selected. Information was collected by questionnaire method, three day's individual diet survey, anthropometric measurement, clinical examination. Haemoglobin level was estimated by blood colour matching test. The hostel authority served a glass of milk in the morning, Lunch and dinner. The two major meals consisted of vegetable, dal, rice and chapati. The mean intake was marginally adequate and rest of the foodstuffs intake was more than adequate. Mean intakes of all the nutrients were more than adequate. The weight for height of subjects were less than standard values. Ten percent subjects were under weight. B-complex, Vitamin C and iron deficiency (18% m 6% & 4% respectively) were observed. Thirtyseven percent of subject's haemoglobin level was between 12-15 gm/100ml of blood and rest of sixty seven percent had haemoglobin level between 6-11 gm/100 ml blood. Hence this study conclude that efforts should be made to improve the haemoglobin level of these subjects.

PSP
CN.23

23. NUTRITIONAL DEFICIENCY DISEASES IN SCHOOL GOING CHILDREN AGE IN AGRA

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and MEENA SINGH**

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In present study, 600 children of school age (6-12 years) were selected. These children were examined for clinical symptoms of nutritional deficiencies. The signs of PEM like hair changes, muscle wasting and oedema were seen in 18.3%, 10.4%, 1.8% respectively. Vitamin A deficiency was observed by signs associated in eyes and skin i.e. 3.8%, 6.2% respectively. The prevalence of Bitot's spot was higher i.e. 3%. The signs associated with vitamin B complex like cheilosis and cheilosis + stomatitis were only in 0.5%, while glossitis, red raw and fissure in tongue were in 1.2% children. The signs associated with vitamin deficiency were bleeding gums and haemorrhage under skin, seen in 0.5%, 0.8% respectively. The signs related to vitamin D deficiency were bowleg and Harrison suclus in 31%, 0.5% respectively. The signs associated with iron deficiency like koilonychia of nails, atrophic lingual papillae, pale conjunctiva and pale palm were observed in 4%, 23.3%, 52.7%, 48.5% respectively. In conclusion, the results revealed that nutritional deficiencies prevalent in school going children in Agra were PEM, vitamin A and vitamin D deficiencies and iron deficiency anaemia.

PSP CN.24

24. MALNUTRITION IN SCHOOL AGE CHILDREN IN AGRA USING MUAC AND HC RATIO

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Malnutrition is the greatest single cause responsible for disability among children in the developing world. Malnutrition occurs at the crucial period of the physical and mental development of child. It has permanent ill effects on the grwoth and development of the child. The MUAC and HC of 600 school age children in Agra were measured according to methods given by Jelliffe. Mean and chi-square tests were used in the study. The children were classified according to areas, age groups and sex. The result revealed that 40.3% children showed mild or moderate malnutrition (MUAC/HC <.310 to .250) and only 0.5% showed severe malnutrition (MUAC/HC<.250). The prevalence of malnutrition was higher in slum areas in age group 6 years and in male children i.e. 49.5%, 64.6%, 42.6% respectively. The difference in malnutrition was highly significant in different areas (X^2 =20.71, df=2, p<0.001) and age groups (X^2 = 103.35, df = 2, p<0.001). However, the sex difference was not significant in these children. Thus, therefore, the study concludes that malnutrition differs significantly in different areas and age groups.

PSP CN.25

25. EFFECT OF SOLAR DRYING IN SOLAR COOKER ON NUTRITIVE VALUE AND ORGANOLEPTGIC PROPERTIES OF MINT

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Haryana Agricultural University
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The study was undertaken with the obectives of investigating the time taken for drying mint by different methods of drying along with analysis of nutritive value and organoleptic properties of solar dried mint in solar cooker. Initially, the mint leaves were separated from the stalk and washed with distilled water. The time taken for sundrying of leaves at 38 degree C was 4 hours and four and half hours when dried on black and white blotting papers, respectively. Time period for solar dried leaves and leaves dried in shade was 1.1/2 hours and 4 days respectively. The ascorbic acid content decreased from 27 mg/100 g in fresh mint leaves to 21 and 18 mg/100 g respectively when solar dried in containers with and without lids. Similarly iron content decreased from 16.2 mg/100g in fresh leaves to 14.8 and 11.7 mg/100 g when kept in solar cooker for solar drying on containers with and without lids respectively. Solar dried leaves when incorporated in conventional recipes including curry, paratha, mintade, chutney and raita were found to be organoleptically acceptable to human palate. Curry was most acceptable followed by raita and paratha while chutney and mintade were slightly desirable or acceptable.

19th December 1992

Venue : ASSEMBLY HALL

Time : 10.30 a.m. - 11.10 a.m.

FREE COMMUNICATION SESSION - II : **Experimental Nutrition**

Chairperson : Dr. Usha Chandrasekhar

SLP EXP.1

1. EFFECT OF INDIGENOUS FERMENTATION ON IN VITRO DIGESTIBILITY OF BARLEY-BENGAL GRAM BLEND

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The protein-mineral-phytate complexes in plant foods are known to adversely affect the nutritive value of plant foods as they inhibit the proteolytic and amylolytic enzymes and result in lower digestibility of protein and starch. Fermentation is one of the processing methods which improves the nutritive value of various cereals and legumes by reducing the content of antinutrients. In the present study, buttermilk fermentation of barley-bengal gram blend (50:50 w/w) at 25, 30 and 35 ^{o}C for 12, 18 and 24 h improved the protein digestibility; it was raised from 61 percent in unfermented blend to 82 percent in the blend fermented at 35 ^{o}C for 24 h. Similarly, starch digestibility was enhanced to the extent of 6 to 25 percent over the control values, depending upon the temperature and period of fermentation. Higher the temperature and longer the period of fermentation, more was the improvement in digestibility of starch and protein. A significant negative correlation was found between the phytic acid content and digestibility of the fermented blends.

SLP EXP.2

2. DISACCHARIDASES AND GLUCOSE UPTAKE IN BRUSH BORDER MEMBRANE VESICLES OF MALNOURISHED YOUNG RHESUS MONKEYS

S.V.RANA, D.GUPTA, S.MEHTA, A.K. MALIK, S.K. MEHTA

Department of Gastroenterology
Postgraduate Institute of Medical Education & Research
Chandigarh

Twelve male young rhesus monkeys with body weight 1.5-2.0 kg were acclimatized in the Institute's animal house. Six were kept as controls provided with 4.84 g protein and 110 Kcals/kg body weight/day casein based synthetic diet while 6 experimental animals received 2.42 g protein and 55 Kcals/kg body weight/day diet with an aim to produce mild to moderate malnutrition. After 25-30% reduction in body weight, animals were sacrificed and brush border membrane vesicles were prepared from proximal, middle and distal part of the small intestine. Purified vesicles were used for the assay of lactase, sucrase and maltase. Glucose uptake was studied using glucose ($U\text{-}C^{14}$). All the disaccharidases and glucose uptake were decreased in all three portions of small intestine in malnourished monkeys. Histologically there was evidence of mild to moderate villus atrophy. Present study suggests that even mild to moderate malnutrition alters the digestion and absorption of disaccharides and glucose in small intestine.

SLP EXP.3

3. NUTRITIVE VALUE OF DIFFERENT TYPES OF PRESERVED MUSHROOM

M.DAS and V.ANURADHA

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Avinashilingam Deemed University
Coimbatore

The aim of the study was to preserve different varieties of mushroom by simple methods like sun-drying, dehydration and freezing and to assess the nutritive value of the preserved mushroom in terms of mineral, protein, carbohydrate, fats and energy content. Nutritive value of three different varieties of preserved mushroom namely Pleurotus sajor caju, Agaricus bisporus and pleurotus citrino pileatus was studied. Variations in mineral, protein, fat and energy content were observed among the techniques and the varieties. However, among the methods of preservation sun-dried and dehydration method was found to be superior than the frozen method.

SLP EXP.4

4. EFFECT OF OIL TREATMENTS ON THE LEVELS OF ANTINUTRITIONAL FACTORS IN CALLOSOBRUCHUS CHINENSIS (L) INFESTED-STORED PULSES

USHA MEHTA and RAJNI MODGIL
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Hisar-125 004

Coconut, groundnut and mustard oil treated whole red gram, green gram and Bengal gram were infested with Collosobruchus Chinensis (L) and stored for 6 months. At monthly intervals the levels of antinutritional factors, phytic acid, trypsin inhibitor activity (TIA) and saponins were analysed. The values of phytic acid and TIA of treated and untreated pulses were similar at month one. The saponin content of green gram and Bengal gram was however higher in control than the oil treated pulses at month one. Thereafter, the untreated controls had a progressively higher phytic acid saponins and TIA levels till six months, when compared to their respective oil treated counterparts. In mustard and groundnut oil treated pulses, the phytic acid, TIA and saponin values remained unchanged from month 4 uptill the end of month 6, however the values of coconut oil treated pulses increased during month 5 till the end of sixth month.

SLP EXP.5

5. LIPID CLASSES AND FATTY ACID COMPOSITION OF SOME MINOR SEEDS OF CENTRAL INDIA

A.M.MOHARIL, A.S.KULKARNI, R.R. KHOTPAL and H.A. BHAKARE

Department of Oil Technology
Laxminarayan Institute of Technology
Nagpur Univesity, Nagpur-440 010

Lipids contribute to the nutritional value and characterstic aroma and flavour in fruits. The determination of the lipid classes and their fatty acid composition of fruitseeds is useful in understanding membrane composition, source of flavour and nutritionally important fatty acids.

This work reports on the major lipid classes and their fatty acid composition in Zizyphus jujuba and Melia azedarch seeds found in Central India. Total lipids amounted to 23.4 and 37.9% which in turn consisted of neutral lipids 88.4, 87.6%, glycolipids 6.8, 7.2% and phospholipids 4.8 and 5.2% respectively. The major fatty acids present were palmitic, stearic, oleic and linoleic acids.

19th December 1992

Venue : CONFERENCE HALL

Time : 10.30 a.m. - 11.10 a.m.

FREE COMMUNICATION SESSION - II : **Experimental Nutrition**

Food Safety

Chairperson : Dr. Sheela Sidharam

SLP
EXP.6

6. BIOAVAILABILITY OF THIAMINE IN COW MILK AND CURD USING RAT BIOASSAY

A.D.DEODHAR and Raghvender Singh

Division of Animal Biochemistry
National Dairy Research Institute
Karnal-132001

Bioavailability of thiamine in cow milk and curd was assessed using thiamine depleted young rats. Repletion diets provided suboptimal dosage of 15/ug thiamine/day from pasteurized cow milk, curd or pure thiamine for 21 days. Total heptic thiamine, erythrocyte transketolase (ETK) activities with/without added thiamine pyrophosphate (TPP) and TPP effect were response criteria. Restoration of total hepatic thiamine and ETK activity was more significant ($P<0.01$) in the group receiving curd than milk, while these were higher in milk receiving than pure thiamine receiving group. It was concluded that bioavailability of milk thiamine was greater than pure thiamine. The effective factor(s) was present in the milk retentate obtained on dialysis of raw cow milk. Its influence on the bioavailability of non-milk thiamine was assessed in similar manner. Rats receiving milk retentate supplemented with pure thiamine showed significantly ($P<0.05$) greater restoration of total hepatic thiamine and ETK activity and least TPP as compared to rats receiving pure thiamine or milk retentate alone. The estimate of the influence of milk factor(s) on non-milk thiamine availability corrected for base line data showed enhanced bioavailability of non-milk thiamine by two-fold in the presence of milk factor(s).

SLP EXP.7

7. FIBRE CONSTITUENTS OF SOME PLANT FOODS

BINITA RANI and ASHA KAWATRA

Department of foods & Nutrition
Haryana Agricultural University
Hisar-124 004, Haryana

Some plant foods viz. bottlegourd, carrot, cauliflower, cabbage, green bengal gram, pea, apple, plum, guava, karonda, blackgram husk and lentil husk were analysed for their dietary fibre component. The total dietary fibre content of these foods varied from 14.68 to 78.21 percent on dry matter basis. As compared to fruits and vegetables both the husks had higher amount of total dietary fibre. Cellulose represented the major fibre constituent in most of the foods whereas, husks were observed to be good sources of hemicellulose. All foods were poor in pectin and lignin contents except guava.

SLP EXP.8

8. THE NUTRITIONAL STATUS AND STREPTOLYSIN TOXICITY IN RATS

C.MANJREKAR and K.NARASIMHAMURTHY
Department of Nutrition and Food Safety
Central Food Technological Research Institute
Mysore-570 013

Acute rheumatic fever affects children, often with irreversible debilitating consequences. Beta-haemolytic streptococci A have been identified as the causative, however, not single agent. The bacterial toxins streptolysin O and S are assumed to affect specifically heart, joints, brain, but also liver and kidneys. An animal experiment was designed where 3 groups of weanling rats were fed a standard diet each ad libitum, 3 other groups were fed 50% of this diet for 6 weeks. During the third and the fourth week 2 groups of well nourished and 2 groups of undernourished rats each were injected streptolysin O, 500 U and streptolysin S, 200 U, respectively. Progress of the animals' weight was recorded regularly. The rats were sacrificed after 6 weeks, heart, brain, liver, kidney and a joint collected and examined histologically. The liver of the 2 groups which received streptolysin O showed mild pathological changes, pathological changes of the kidney were found in the undernourished group. All organs of rats receiving streptolysin S were unaffected. Heart and brain of all groups were normal. The weight increase of toxin treated and control groups did not show any difference, nor did the injected animals exhibit any symptoms of disease.

SLP FS.1

1. THE HYGIENE MAINTAINED IN GIRLS' HOSTEL KITCHENS OF CHANDIGARH WITH SPECIAL REFERENCE E.COLI

H.NANDINI and M.KAUL

Government Home Science College
Chandigarh

Fifteen girls hostel Kitchens in Chandigarh were surveyed for screening of food and swab samples. The highest percentage of isolation of E.coli from swab samples was from nails (55.5%) followed by wiping cloths (53.3%) and cutting board (44.4%). The study of virulence properties of the isolates showed that 12% of the strains were multidrug resistant, 38.7% of the food isolates and 47.3% of the swab isolates were enterotoxin producers while 64.5% of food and 57.8% of swab isolates showed high hydrophobicity. The microbial load of food was directly proportional to the student strength of the hostel. Amongst the methods tried for decreasing the microbial load of wiping of cloths, detergent (Vim) wash and chemical disinfection (Dettol and sodium hypochlorite) brought about significant reduction in the microbial load (4-6 log cycles). Drying the cloths at 80 ^{o}C for one hour reduced the load also by 6 log cycles. For cleaning of working surfaces, phenyle was found to be most effective followed by dettol. Hygiene practices followed by food handlers showed that only soap or detergent was used to clean wiping cloths, equipment and hands. A disinfectant was used only for cleaning the floor of the kitchen once in 2-3 days.

SLP
FS.2

2. RADIATION PRESERVATION OF ONION

M.P. CHACHARKAR, A.K. WADHAWAN, D. KUMAR N.K. SONI and U.S. CHAUHAN

Defence Laboratory
Ratanada Palace
Jodhpur-342 001

Following the recommendations of the Joint FAO/IAEA/WHO Expert Committee and the Codex alimentarius Commission which concluded that the foods irradiated upto an average dose of 10kGy as the processing technique are safe from health angle, over 35 nations have permitted irradiation of about 40 food items. The DRDO's Nagaratnam Committee examined the prospects of irradiation of food for the Armed Forces, and concluded that irradiated foods were wholesome and nutritious.

The Government of India has accorded statutory clearance for irradiation of spices, frozen sea foods and onions for export; for domestic consumption irradiation of spices, onions and potatoes are awaiting notification amending PFA Rules to include irradiation of food, and to regulate licensing and labelling.

Storage trial was carried out from August to December. It was shown that quantity of the good quality onions was two times in case of irradiated onions as compared to the control stuff. In late December and January, the quantity of

sprouted unirradiated onions was more than 90%. Consequently, radiation processing of onions has positive gain. For economic running of a radiation facility, the clerance of limited commodities is not sufficient. This aspect needs in depth analysis.

19th December 1992

Venue : Foyer - Ground Floor Gopalan Block

Time : 10.30 a.m. - 11.10 a.m.

POSTER SESSION - II : **COMMUNITY NUTRITION**
CLINICAL NUTRITION
FOOD SAFETY
OTHER CATEGORIES

PSP
CN.26

26. MESSAGE DISSEMINATION TO RURAL WOMEN ON KITCHEN GARDEN AND SOCIAL FORESTRY

CANDY, INDU GROVER and URVASHI GOYAL

Department of Extension, Education, CCU
Haryana Agricultural University
Hisar-125 004, Haryana

In order to improve nutritional status and educate rural families on feasible income generating alternatives, messages selected on basis of judges consenses were kitchen garden and social forestry. Two messages related to kitchen garden namely importance of fruits and vegetables (NI) and growing of vegetables and fruit in home garden and their consumption (MII) were disseminated to 120 rural women selected from 4 villages with the help of 22 and 53 coloured synchronized slides with commentary respectively in small group situation. Pre and post test methodology was followed. Majority of the respondents had low consumption of vegetable and fruit throughout the year and low nutritional knowledge in this regard. The respondents had higher gain of knowledge for message II compared to message I probably as message II was perceived to be more simple, need based, of higher practical and functional value. Trees identified as most suitable for propagation under social forestry for semi arid regions were poplar, jandi, neem, lemon, kinnu and ber. In an action research methodology followed to study acceptability on a sample of 120 rural women majority perceived that social forestry had high relative advantage, compatability, and was simple to adopt. For home planatation, fruit trees were preferred while others were

preferred for waste land/forms. Success lies in making these programmes acceptable to the masses through regular knowledge and skillful transmission exercises.

PSP
CN.27

27. PERCEIVED FIELD APPLICABILITY OF FOOD AND NUTRITION MESSAGES FOR PACKAGE DELIVERY

INDU GROVER and SHASHI KANTA

Department of Extension Education
College of Home Science
Haryana Agricultural University
Hisar-125 004, Haryana

A main step in the transfer of technology is the finalisation of technical recommendations for onward transmission to be clientele group. The objective of the study was to ascertain the perceived field applicability of foods and nutrition messages for annual package delivery by field functionaries and rural women clientele. The sample comprised of 30 field functionaries and 360 rural women i.e. 30 being drawn from a village each of the 12 districts of Haryana State. Field applicability of each message was measured on five attributes, viz. relative advantage compatability, simplicity and triability. Eleven messages namely diets (M1), feeding practices (M2), diets during illness (M3), nutritional recipes (M4), nutritional enrichments (M5), conservation of nutrients (M6), preservation (M7), milk utilization (M8), safe drinking water (M9), vegetable and fruit consumption (M10) and selection of food (M11) with 2-3 subcomponents each were selected for package on basis of 80% judges consenses. On the whole the perceived mean scores for all messages and their subcomponents were higher for field functionaires than beneficiaries while the spearman rank order correction was

0.8 and significant. Further, inter district differences in mean score for the messages were noted.

PSP CN.28

28. ANALYSIS OF NUTRIENTS AND FORMULATION OF RECIPES USING MALTED FOXTAILE MILLET (SETARIA ITALICA)

S.RADHAI, S.VASANTHAMURALI,

Department of Nutrition
P.S.G. College of Arts & Science
Coimbatore

A study was carried out to produce malt from Foxtaile millet (Setaria italica). Effect of various media namely water, gibberellic acid (10ppm/kg) and potassium bromate (100 ppm/kg) on malt yield; various soaking hours (30 hours and 72 hours) on the nutrient content of foxtaile millet malt (CO 5) were studied. In addition the malted flour was used in the preparation of biscuits and weaning mixtures. Nutrient analysis revealed that 30 hours steeping using gibberellic acid as an inducer with a germination period of 40 hours helped to extract significantly higher quantity of malt and retained maximum amount of nutrients (Energy 296 Kcal; protein 10.5 g; fat 3.3 g; iron 100 mg; calcium 38 mg; phosphorus 240 mg and vitamin C 6.5 mg per 100 g). Incorporation of malt (maida : malt - 50 : 50) in biscuits preparation furnished sufficient amount of nutrients (Energy 225 Kcal; protein 3 g; carbohydrate 29 g and fat 10g/100 g) and were highly acceptable. The formulated inexpensive weaning mixtures with malted flour supply 310 Kcal energy 13.3 g of protein and 7.3 g of fat. Value is comparable to that of commercially available products. Incorporation of this high quality malted flour will improve the production and enhance the availability of low cost bakery products and weaning mixtures in our Indian market.

PSP
CN.29

29. PATTERN OF CONSUMPTION OF IODISED SALT AND IDD AWARENESS IN BOMBAY

JAGMETT MADAN and NINA S. DODD

Department of Food Science and Nutrition
S.V.T. College of Home Science
S.N.D.T. Women's University,
Bombay-400 049

A group of 352 Municpal School children and women belonging to different socio economic strata in Bombay was interviewed using a pretested, preplanned questionnaire to obtain information with regard to salt consumption pattern and awareness of various aspects related to IDD. Ninety two percent of the children surveyed were not aware of effects of IDD and iodisation of salt. Similar observations were made in the women. The level of awareness increased with improvement in the socio economic strata. Ninety five percent of the women surveyed from lower socioeconomic strata were consuming non-iodised salt and majority of them were buying the coarse, non-branded loose salt from vendors. Five percent of the women consuming iodised salt were themselves not aware of its significance. Sixty percent of higher income group and 44% of middle income grup were consuming iodised salt.

PSP CN.30

30. FOOD SUPPLEMENTATION OF RURAL PRE-SCHOOL CHILDREN VERSUS NUTRITION EDUCATION OF THEIR MOTHERS

HARVINDER KAUR, R.PURI and R. SACHDEVA
Department of Foods & Nutrition
College of Home Science
Punjab Agricultural University
Ludhiana

Eighty five preschool children (3-5 years age, belonging to of low socio-economic group) were selected from two villages of Ludhiana district to assess the impact of nutrition education and food supplements rich in energy, protein, iron, folic acid and ascorbic acid on the nutritional status of the children. The children were divided into three groups i.e. Supplemented Group (SG), Nutrition Education Group (NEG), and Control Group (CG), the number of children being 38,24 and 23 in the three groups respectively. Nutrition Education was imparted to the mothers of NEG for 3 months. Three nutritious snacks were fed to SG one each day on six days a week (except Sunday) for 3 months. The dietary survey of children was conducted at the beginning of the study (T1) and at the end of the study i.e. after 3 months of period (T2). At T, the diets were grossly inadequate in all the three groups. In NEG and SG at T2, there was an increase in the intake of cereals, pulses, green leafy vegetables and milk and milk products but lesser than the suggested recommendations by ICMR, 1984. The lower intake of food groups resulted in inadequacy of almost all the nutrients at T1 in the three groups. At T2 there was significant increase in energy, protein, iron, retinol equivalent, thiamine, riboflavin, folic acid and

ascorbic acid only in SG. However, less impact was shown by NEG as compared to SG. Nutrition education resulted in significant improvement in knowledge, attitude, practices (KAP) scroes and nutritional status of children.

PSP
CN.31

31. INTAKE OF NUTRIENTS AND ANTINUTRIENTS BY ADULTS

PARMINDER, K., GREWAL and CHARANJEET K. HIRA

Department of Foods and Nutrition
Punjab Agricultural University
Ludhiana

Dietary survey of 120 men and 102 women of ninety families, thirty each from low, middle and high income groups of Punjab Agricultural University campus, Ludhiana was carried out during winter of 1990 for three consecutive days. The nutrient intake of adults was calculated using Indian Food Composition Tables. The antinutrients namely phytate, oxalate, polyphenol and dietary fibre were calculated based on analysis of collected food samples from one third of the families surveyed. The results revealed that diets of low income men and women were deficient in all nutrients. The adults of middle and high income families consumed more than adequate amount of nutrients except the consumption of iron (13.9 to 18.0 mg/d). The riboflavin intake was marginally meeting the requirement of adults belonging to high income group but in middle income group it was less than the recommendations. The consumption of antinutrients decreased with decrease in family income. The intake of antinutritional factors was more among males as compared to females, though the differences were non-significant due to overall more consumption of various foods rich in these inhibitory factors.

PSP CN.32

32. SOCIO ECONOMIC STATUS AND DIETARY INTAKE PATTERNS AMONG ARTISAN HOUSEHOLDS IN RURAL KARNATAKA

D.CHANDRAPRABHA, T.CHANDRASEKHAR and JALAJA SUNDARAM

National Nutrition Monitoring Bureau (ICMR)
Karnataka Unit
State Health Directorate
Bangalore

Assessment of the dietary intake pattern among different socio economic groups in the community helps in nutrition education strategies. Nutrition Monitoring data of 125 Artisan households, out of 705 selected rural households covered in 4 districts in Karnataka, was analysed for their socio economic status and diet survey data of 84 households was analysed for dietary intake assessment. The data revealed the following, 90% live in Nuclear or Extended families, 59% have income less than Rs. 500 per month, 87% do not possess any milch cattle, 60% do not possess any land, 64% do not grow any crops and 69% live in Kacha houses. The dietary intake pattern revealed the following consumption pattern. Foodstuffs : cereals and millets 406 gms, pulses 26 gms, green leafy vegetables 42 gms, other vegetables 22 gms, roots and tubers 28 gms, condimants and spices 28 gms, Nuts and Oils 8.5 gms, sugar and jaggery 7 gms. Nutrients : protein 41.7 gms, energy 1774 Kcals, calcium 435 mgs, iron 23 gms, vitamin A 423 micrograms of retinol, thiamine 0.51 mg and riboflavin 0.51 mg. The results highlighted the poor socio economic status and low intake of energy and vitamins among rural artisans and hence the need for special efforts in improving economic

conditions and nutritional status of this group of rural population.

PSP CN.33

33. THE ROLE OF NUTRITIONAL FACTORS IN THE PREVALENCE OF ANAEMIA IN CHILDREN BELONGING TO LOW SOCIO ECONOMIC GROUP

MANISHA KALE** and ASHA MANE*

* College of Rural Services, Amravati (M.S.)
** Swami Satramdas College, Amaravati (M.S.)

The study was carried out to understand the relationship between nutritional factors and anaemia. A sample of 500 children (269 male children, 231 female children) belonging to low socio-economic group of age 0-5 years from slum area of Amravati city was selected. To study nutritional factors diet survey, clinical examination, anthropometric measurements and biochemical examination were done. Diet survey was conducted by means of questionnaire and weighment of raw foods. Biochemical examination was done by haematological investigations (Haemoglobin percentage, packed cell volume and peripheral smear examination). To see whether the prevalence differed significantly according to nutrient intake (nutrients which can enhance iron absorption for eg. protein, iron vitamin C, vitamin B_{12}, folic acid, vitamin A and iron bioavailability) chi square (X^2) test was applied and it was observed that there was significant association between protein intake ($X^2 > 6.63$), iron intake ($X^2 > 3.84$), Vitamin C intake ($X^2 > 6.63$), vitamin B_{12} intake (X^2 6.63), folic acid intake ($X^2 > 6.63$), iron bioavailability (X^2 5.99) and prevalence of anaemia. There was significant association between nutritional deficiency signs ($X^2 > 6.63$) and prevalence of anaemia. Mean haemoglobin for the entire group was 9.08 gm

and majority of children have microcytic hypochromic type of anaemia. There is strong relationship between nutritional factors and anaemia and therefore there is need to improve nutritional status by giving nutrition education and improving socio-economic conditions as well.

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COMMUNITY HEALTH CELL
326, V Main, I Block
Koramangala
Bangalore-560034
India

PSP CN.34

34. THE ROLE OF NON-NUTRITIONAL FACTORS IN THE PREVALENCE OF ANAEMIA IN CHILDREN BELONGING TO LOW SOCIO ECONOMIC GROUP

MANISHA KALE** and ASHA MANE*

* College of Rural Services, Amravati (M.S.)
** Swami Satramdas College, Amaravati (M.S.)

To study aforesaid aim a sample of 500 children (269 male children and 231 female children) belonging to low Socio-economic group of age 0-5 years from slum area of Amravati City was selected. Data was collected by questionnaire and experiment method. Prevalence of anaemia was found out with the help of Sahali's method and micro haematocrit. Type of anaemia was found out with the help of peripheral smear examination. Microscopic stool examination was also carried out for parasitic infestation. Expert's opinion was obtained in all the cases. Non-nutritional information was collected with the help of questionnaire method. In order to test whether prevalence differed significantly according to non-nutritional factors (age, sex, birth weight, birth order, type of family, size of family, socio-economic status, environmental conditions, personal hygiene, worm infestation, morbid conditions and immunization) chi square (X^2) test was applied and it was observed that there was significant association between birth order ($X^2 > 6.63$), type of family ($X^2 > 3.84$), size of family ($X^2 > 5.99$), socio-economic status ($X^2 > 5.99$), environmental conditions ($X^2 > 5.99$), personal hygiene ($X^2 > 6.63$), worm infestation ($X^2 > 6.63$), morbid conditions ($X^2 > 6.63$), immunization ($X^2 > 5.99$) and prevalence of anaemia.

But there was no association between age ($X^2 < 3.84$), sex ($X^2 < 3.84$) birth weight ($X^2 < 3.84$) and prevalence of anaemia. Hence prevalence of anaemia can be reduced by giving more emphasis on non-nutritional factors affecting anaemia through health education.

PSP CN.35

35. THERAPEUTIC EFFICACY OF FOOD IRON & MEDICINAL IRON ON ANAEMIC SCHOOL AGE CHILDREN - A COMPARATIVE STUDY

NANDINI SARWATE*, KAMALESH SHARMA** and S.D.SINGH***

*Government N.G.P.G. College, Indore
**Dr.Ambedkar National Social Science Research Institute, Indo
*** M.G.M. Medical College, Indore

School age children are not considered vulnerable with respect to health and nutrition and are neglected lot in this regard. They suffer from many nutritional deficiencies, 'Anaemia' being the most prevalent one. An indigenous sweet was prepared from vegetarian food sources including Jaggery, Sesame seeds, Bengal gram flour and dried Dates for iron supplementation. A comparative study of this food (iron supplementation) to anaemic children was carried out vis-a-vis 'Folifer' medicinal iron for one month. Results on monitoring of Haemoglobin levels increment show better results with food iron supplementation than medicinal iron supplementation.

PSP CN.36

36. EFFECT OF SELECTED INTERVENTIONS ON THE HEALTH AND NUTRITIONAL STATUS OF WOMEN

S.MEHTA AMITA and S.DODD NINA
Department of Food Science and Nutrition
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S.N.D.T. Women's University, Bombay-400 049

In this study, the health and nutritional status of working women (n=160) and housewives (n=80) of Bombay was assessed by clinical and medical examinations, anthropometric measurements, and dietary intake study. Nutrition education, dietary counselling behaviour modification and supplementation (iron/nutrition supplements) were the main strategies selected to improve the health and nutritional status of women. Non-formal educational channels consisted of three-dimension approaches, i.e. lecture-demonstration, group discussion, audio-visual aids in the local language, role playing, nutrition games, and pre- and post-NKT were the different instruments used to increase their nutrition knowledge and awareness. Dietary counselling was offered to all respondents to discuss their personal eating habits, to solve their main diet and health - related problems, i.e. underweight, overweight/obese, iron deficiency anaemia, diabetes mellitus, hypertension etc. The results of the present study showed positive impact of the above strategies to increase the knowledge of women which helped them to solve their diet - related health problems. A significant improvement ($P<0.005$) in the consumption of vitamin A and vitamin C-rich foods by both groups of women. Sixty percent

of underweight women increased their mean body weight (2.0 kg) within four months, while forty percent obese/overweight women reduced their body weight (3-5 kgs). Fifty percent of the hypertensive women took action to bring down their blood pressure to a normal level. A significant improvement in Hb levels was seen in the anaemia women.

PSP
CN.37

37. NUTRITIONAL AND ORGANOLEPTIC EVALUATION OF SELECTED RICE BRAN PRODUCTS

URMIL MEHTA and MANDEEP KAUR
Department of Foods & Nutrition
Punjab Agricultural University
Ludhiana

Results for nutritional and organoleptic acceptability of Rice-bean quality showed that it contained good amount of crude protein, crude fibre, available lysine, calcium, zinc and copper. The milling of rice-bean whole meal into flour resulted in significant decreases ($P<0.01$) of 11.9, 39.78, 6.85, 51.78 and 38.46 percent respectively for crude protein, crude fibre, available lysine, calcium and copper contents respectively. Ricebean flour could be supplemented with wheatflour (10.30 percent) in Chapatis & paranthas which resulted in increase of crude protein, ash and crude fibre contents. The calcium, iron zinc, copper and available lysine increased significantly ($P<0.01$) whereas methionine, lysine and tryptophan contents decreased ($P<0.01$). Blends of ricebean wholemeal with blackgram dhal (50:50 and 75:25) improved the organoleptic quality of Vadas. In supplemented Vadas the crude fibre, calcium, iron and zinc contents increased significantly ($P<0.01$) whereas methionine, lysine, tryptophan and available lysine decreased. In ricebean supplemented Pakoras the crude fibre and calcium contents increased significantly ($P<0.01$) whereas methionine and tryptophan contents decreased with increasing level of ricebean in the blend.

PSP
CN.38

38. MATERNAL ATTITUDES TOWARDS BREAST FEEDING AND INFANT GROWTH

J.NEELA, P.B. PILLAI, and LEELA RAMAN

National Institute of Nutrition
Hyderabad-500 007

The present study was planned to find out the attitudes of mothers on breast feeding practices and explore the relationship between the breast feeding and the characteristics of the population. The present study was carried out at the Family Welfare Centre (FWC) located in the campus of Military Hospital, Secunderabad. The group was studied because of their unique characteristic of being drawn from various parts of the country and belonging to either rural or urban areas. Majority of the women were in ideal reproductive age between 20-29 years, and 85% had normal hospital deliveries. Results indicated that breast feeding practices were considered important by almost all the subjects. It was also felt by the subjects that feeding colostrum was essential for the health of the infant. Majority of mothers expressed the opinion that the infant should be breast fed as long as possible. About half of them favoured introduction of supplements at the age group of 3-4 months. It was observed that the attitudes of mothers towards breast feeding practices were positive. The population is still in a transitional phase from traditional rural to modern urban culture with all its advantages and trappings.

PSP
CN.39

39. MATERNAL INFLUENCES ON THE BIRTHWEIGHTS OF INFANTS

KIRAN SINGH

Banaras Hindu University
Varanasi

Low birth weight is a common problem in India especially in rural areas. It is known to be influenced by a variety of maternal factors. The present study was conducted to identify such factors which had a bearing on the baby's birth weight. Two hundred and eighteen pregnant women, from Kashi Vidyapeeth Block of Baranasi were enlisted for the study. Maternal factors such as weight, height, percapita income, education, protein, calorie and iron consumption per day were assessed. The results showed that some of the factors played a key role in the low birth weight of infants.

PSP CN.40

40. EPIDEMIOLOGY OF LOW BIRTH WEIGHT IN MANGALORE

PADMA MOHANAN, M.S.KOTIAN, ASHA KAMATH, B.MOTHA and MOLLY PHILIP

Department of Community Medicine
Kasturba Medical College
Mangalore

This prospective study is of mothers of 2460 singleton live new borns from one teaching hospital (Lady Goschen Government Hospital), Maternity Surgical Centre (Private Hospital) and another missionary hospital in Mangalore city from July 1st 1989 to 30th June 1990 to determine the maternal factors and other socio-economic factors responsible for low birth weight babies. The prevalence of prematurity was found for factors like age, occupation, education, type of family, haemoglobin level, parity, Blood group, Rh grouping etc. using the SPSS package in Computer (PC-XT) the statistical analysis was done. Age of the mother, educational status, Religion and BMI in relation to Birth Weight was found to be statistically significant by Fisher's test.

PSP CN.41

41. GROWTH TRENDS AND NUTRITIONAL STATUS OF SCHOOL GOING CHILDREN AT WARDHA

A.A.PATWARDHAN and S.R.UBGADE

Lakshminarayana Institute of Technology
Nagpur University
Nagpur

Nutritional status of an individual depends on a number of nutritional and non-nutritional factors. A nutrition survey was carried at on 348 girls and 422 boys from rural and urban schools to assess their nutritional status and associated factors. About two thirds of the parents of the children had no formal education, and were not aware of balanced diets. Seventy nine percent of the parents were agricultural labourers and had percapita monthly income of Rs. 100-133. Body Mass Index (BMI) for 10 - 19 year old children ranged from 13-18 as compared to 15 to 20 reported by the NIN. The weights of the children were 2 - 8 kg, lesser than those reported by the NIN, the deficit being higher in the 13-16 year old. The energy intakes were as follows:

18% of 10 - 11 year old : 1300 Kcal (RDI 2100)

43% of 12 - 15 year old : <2500 Kcal (RDI 2500)

38.6% of 16 - 19 year old : <2500 Kcal (RDI 3000)

Nutritional deficiency signs showed an association with BMI. Peak velocity in growth was observed between 10-16 years and decreased by 17-19 years.

Low purchasing power, because of very few job opportunities and consequent low income seems to have affected the nutritional status of children.

PSP CLN.1

1. IRON CONTENT IN DRINKING WATER OF REWA REGION OF MADHYA PRADESH

KIRANLATA SHRIVASTAVA* and KRISHNA, B.PANDEYA**

*Govt. Girls College, Rewa (M.P.) **Department of Chemistry A.P.S. University, Rewa (M.P.)

Iron is an essential element in human nutrition. In the present work we have carried out estimation of iron content of the drinking water sources in several parts of Rewa region. Four water works, one each located in the four district head quarters and twelve handpumps located in different parts of Rewa town have been chosen for the study. Iron analysis was done on atomic absorption spectrometer by direct aspiration method. Analysis of water from three rivers gave the following result : Bichhiya (in Rewa) 1.1 to 3.1 mg/l, Sone (in Sidhi) 1.1 to 6.2 mg/l and Tumus (in Satna) 0.3 to 4.4 mg/l. Water from twelve handpumps was analysed. The iron content varied from 0.081 to 19.9 mg/l. It has been noted that the iron content of the drinking water in and around Rewa is higher than in other places in India as well as abroad. Also, the content is often higher than the recommended excessive limit. Raw river water is often used for drinking purpose by the inhabitants on the river bank and the handpump water is also consumed as such. Iron content higher than the excessive limit observed in drinking water should be taken as no cause of alarm, as the excessive iron content seems to be filling the gap between the iron requirement and the iron content of the food.

PSP
CLN.2

2. NUTRITION KNOWLEDCE OF NURSES

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The place of nutrition as a subject in curriculum of nursing training and nature and extent of their nutrition knowledge has become the subject of great interest as nurses can conveniently and in a cost effective way, impart nutrition knowledge to patients and their attendants. The present study revealed that knowledge of nurses working in civil hospitals was high (80-100% correct response) regarding the use of food supplements for infants, diet to be given during pregnancy, use of green leafy vegetables as a source of Vitamin A and ill effects of excessive sugar intake etc. But majority of the nurses (45-65%) were not aware of the correct dietary management of peptic ulcer, atonic constipation, CHD and nephrosis. They had moderate knowledge regarding the type of diet to be given in particular disease condition yet they were not aware of particular foods to be recommeded for these diseases. Nutrition as a subject needs to be included in undergraduate and graduate nursing education. Majority of the nurses showed keen interest to become member of Nutrition Society of India.

PSP
CLN.3

3. CALCIUM AND PREGNANCY

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The aim of this study was to screen pregnant woman for clincal and biochemical evidences of calcium deficiency and to supplement calcium in the II and III trimester, the calcium used being 'OSSOPAN FORTE' of T.T.K. Pharma Limited, Madras.

The study included 25 cases of calcium deficiency and 5 control cases diagnosed by both clinical symptoms and biochemical analysis. Study covered primipara and multipara of low socioeconomic group.

Their clinical response to treatment fortnightly and monthly weight gain were noted. The biochemical analysis was repeated monthly in 5 cases and in the rest after symptoms subsided to assess the utilisation of calcium during pregnancy and correction of calcium level after supplementation. The outcome of pregnancy in relation to baby's birth weight was noted in calcium deficient patients with or without medical complications.

It was observed that calcium was utilised more during IInd trimester and in the absence of supplementation, it caused symptoms incapacitating the women, less maternal weight gain and low birth weight. It is concluded that calcium supplementation is beneficial in pregnancy as shown

by the relief of symptoms and required maternal weight gain and baby's ideal birth weight. Ossopan brings these effects effectively and speedily.

PSP CLN.4

4. FAT DEPOSITION IN PREGNANCY AND PREDICTION OF LBW INFANTS

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Low birth weight is established as an antecedent of excess mortality, mental retardation and other neurological disorders in infants. The present study thus aimed at finding a suitable method for detecting women who are nutritionally at risk of giving birth to LBW infants. Indepth information was obtained from the subjects on their personal history, past obstetric performance, complications during pregnancy and gestational duration. The sample comprised of two groups of pregnant women; one in which the effect of maternal weight gain during pregnancy on the birth weight of the infant was studied, and the other selected with the purpose of noting the effect of maternal fat gain in pregnancy on its outcome. Selected anthropometric parameters were then assessed in the subjects throughout the course of pregnancy. Relevant measurements were also recorded in the infants within 48 hours of birth. The relationship of maternal fat and weight gain during pregnancy with the birth weight of the infant was established using Karl Pearson's - coefficient of correlation. The study indicate the possibility that prepregnancy weight, weight gain during pregnancy and maternal weight at term are inter related as well as influence the birth weight of the infant.

PSP
CLN.5

5. EFFECT OF NUTRIENT SUPPLEMENTS DURING PREGNANCY ON THE HAEMOPOETIC PROFILE OF THE NEW BORN

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Pregnant women (107) belonging to low socio-economic status, aged between 18-33 years in their 19-22 weeks of gestation were assessed for their nutritional status and given nutrient supplements for 15 weeks, to evaluate their effect on the new born. Group I consisted of 37 women, who were given one tablet of 200 mg ferrous sulphate/day, containing 60 mg elemental iron and 500 ug folic acid. Group II of 35 women was given the same iron supplement as group I and in addition 2,00,000 I.U. of vitamin A was given as a single dose at the beginning of the study i.e. at 21 + 1 week of gestation. Thirty five women who were not given any supplement but matched in all respects, served as controls. The effect of supplements on the new borns was assessed by biochemical investigation of the cord blood from the placental end at the time of parturition. Haemoglobin (Hb), packed cell volume (PCV) red blood count (RBC), transferrin saturation (TS), and serum iron, zinc, copper, manganese, vitamin A and total iron binding capacity (TIBC) were assessed in the cord blood by standard techniques. At the begining of the study, 70% of women were anemic. Supplemented women of group I and II improved significantly in their Hb level with group II improving significantly more ($P<0.05$) than group I. Controls showed a significant fall in

their Hb level with increasing gestational age. Newborns of women in groups I and II had significantly higher ($P<0.01$) Hb, PVC, RBC, TS and serum iron and vitamin A levels than the controls. Group II had significantly higher values ($P<0.05$) of these than group I. Serum zinc, copper, and manganese values were more or less the same in the three groups with no significant differences between various groups, indicating that these parameters were not effected by nutrient supplements. It can be concluded that iron supplement alone improves the iron indices of the newborn, but iron given along with vitamin A is much more beneficial to iron indices as well as to vitamin A levels of the blood of the newborn.

PSP CLN.6

6. TRIAL OF AN IRON CHELATE (FERROUS GLYCINE SULPHATE) IN THE FORTIFICATION OF COMMON SALT TO CONTROL ANAEMIA

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National Institute of Nutrition has developed formulations for iron fortified salt (IFS) using ferrous sulphate as a source of iron. Ferrous glycine sulphate (FGS), an organic complex of ferrous sulphate and glycine, is extensively used in oral hematinic therapy. As a stable chelate with better iron absorption, FGS is more suitable than ferrous sulphate for fortifying salt. In the present study FGS was tested as an iron fortificant in common salt. The results showed that dry mixing method was better than wet mixing for the fortification of salt with FGS. The oxidation of ferrous to ferric in FGS was less than 2% after one year. The IFS retained the same colour of the unfortified salt even after one year. Iron was stable at the initial level (1000, 750, 500, 250 or 125 ppm) at the end of one year, whether stored at room temperature or high humidity. The *in vitro* iron bioavailaiblity was 3-4 times higher than ferrous sulphate fortified salt. The IFS was easily acceptable in daily cooking in place of unfortified salt. The cost of chemicals of this IFS is slightly lower than the earlier formulations of IFS. The cost can be reduced further by adding FGS at an iron level of 500 ppm since the bioavailability of iron is higher.

PSP CLN.7

7. GLYCEMIC INDEX OF A CEREAL - PULSE MIX IN NIDDM PATIENTS

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Diabetes Mellitus, an endocrine disorder, leads to metabolic derangements in each and every cell of the body due to impairment of carbohydrate, protein and lipid metabolism. Dietary management emphasises on the restriction of calories, avoidance of refined sugars and on the consumption of foods with low Glycemic Index (GI). A cereal-pulse mix comprising of wheat, soyabean, guar gum, fenugreek seeds, certain legumes and pulses was tested for its glucose response in 10 non insulin dependent diabetes mellitus (NIDDM) patients. The cereal-pulse mix produced significantly lower blood glucose response 2 hours postprandially as compared with blood glucose responses to a 50 g glucose load for the same group. The mean percentage of GI of the cereal-pulse mix was 44.0. These initial observations seem to strongly suggest the hypoglycemic effect of the above cereal-pulse mix and its beneficial effect in the control of diabetes mellitus.

PSP
CLN.8

8. COPPER AND ZINC CONTENTS OF COMMONLY CONSUMED INDIAN FOODS AND COMPOSITE MEALS

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Copper and zinc contents of 44 raw food items, such as cereals, legumes, vegetables were estimated using atomic absorption spectrophotometry. The Zn content of foods ranged from 0.3 to 4.5 mg/100 g dry weight while Cu content varied from .05 to 1.23 mg/100 g dry weight. Varietal differences were also studied for 11 market varieties of rice, and 16 of wheat. Zn contents were significantly different between varieties of rice and wheat. The Cu content between different varieties was comparable. Phytate: Zn molar ratio of the cereals exceeded the critical limit of 15, while (Ca) (Phytate) : (Zinc) molar ratio exceeded the limit of 200 mg/kg in case of cereals and pulses. Estimates of Zn and Cu contents of 36 composite diets differing in legumes and vegetables were also obtained on cooked basis using AAS method. When compared with their estimates based on the Cu and Zn values of the raw ingredients there was no significant difference for Cu but Zn contents were higher in cooked diets, indicating contamination effect. It is concluded that care should be taken in applying raw food factors to estimate mineral intakes.

PSP
FS.1

1. NATURAL OCCURRENCE OF AFLATOXINS IN CORIANDRUM SATIVUM

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Aflatoxins were isolated from thirty samples of Coriandrum sativum; eighteen samples were found to be B.G.Y. positive. B_1, B_2 and G were isolated from BGY positive samples. The concentrations of various aflatoxins were determined after separation on silica gel plates, with chloroform - acetone as developing solvents and studying their fluorescence emission.

PSP
FS.2

2. MICROBIOLOGICAL STATUS OF IMARTI

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Two Hundred and Forty Eight samples of Imarti was taken for the survey of microbiological status like Standard Plate Count, mold count, aerobic plate count, coliform count etc. Among the 248 shown samples, 58 samples showed S.P.C. exceedingly high, 92 samples were found to have S.P.C. and Coliform above the PFA and BIS standard. Only 98 samples complied with the standard of P.F.A. and B.I.S. Limit for sweet product sold in Indian Market. The above results were also compared with another traditional sweet Jalebi which is almost an identical preparation. Some pathogenic microorganisms like Shigella, Staphylococcus, Salmonella, Citrabactor were isolated.

PSP OC.1

1. METALLIC SOAPS FROM SOME VEGETABLE OILS

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Metallic soaps such as calcium and magnesium stearates find uses in foods and pharmaceuticals as emulsifying, lubricating and binding agents.

In this work, calcium and magnesium soaps have been prepared from fats rich in stearic acids such as Sal and Mahua fats by precipitation method. The soaps have been analysed for moisture content, metal content, melting point and total fatty acids. The soaps had comparable qualities with those of commercial soaps.

PSP
OC.2

2. FATTY ACIDS FROM SOME MINOR OILS

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Fatty acids have applications in foods such as emulsifier, flavouring agent, defoaming agent, binder, preservative, anticaking agent and diluent.

In this work, fatty acids of seed oils such as Dalbargia sissoo, Acacia catechu and Sorghum dochna have been produced by Twitchell splitting process, varying conditions such as time interval, catalyst concentration and oil to water ratio.

The maximum percentage of fatty acids (92.4%) has been produced in case of Dalbargia sissoo seed oil using 1.5% catalyst concentration at 100 ^{o}C at 12 hours time interval and 1:1 oil-water ratio.

PSP OC.3

3. IMPACT OF PREGRAVID WEIGHTS AND WEIGHT GAIN DURING PREGNANCY ON NEONATAL BIRTH WEIGHT

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Pregravid weights and weight gain during pregnancy in relation to neonatal birth weight was studied in 75 women of Ludhiana, Punjab. The sequence of increase in weight was 2.39, 6.97 and 11.97% of the pregravid weights in the three trimesters respectively. The overall increment in weight was 21.3% of the prepregnant weights. Weight gain throughout gestation ranged from 5 to 20 kg, with an average weight gain of 11.76 $\pm$ 0.36 kg (Mean $\pm$ SEM). Majority of the subjects gained adequate weight during gestation i.e. 10 to 15 kg by 55% and > 15 kg by 10%, however, as many as 35% of the subjects gained less than 10 kg. Weight gained by the mothers during the gestation period correlated positively to neonatal birth weights ($r=0.4231$, $p<0.001$). Similarly, a significant correlation was revealed between maternal pregravid weights and neonatal birth weight ($r=0.2179$, $p<0.01$). Babies born to multiparas were heavier by 158 g than babies of primiparas,the difference, however, was non significant. Findings suggest that while both the pregravid weights and weight gain during pregnancy affect fetal outcome, parity does not exert any such influence.

PSP
OC.4

4. PHYSICAL GROWTH OF RURAL INFANTS

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One hundred rural infants (58 male and 42 female) aged 6-12 months were selected from two blocks of Ludhiana district. The infants were classified into two groups on the basis of age i.e. 6-9 months and 9-12 months and into three income groups on the basis of per capita monthly income, IG I (Rs.300, IG. II:Rs. 301-700 and I.G. III. from Rs. 701 and above. The data showed that there was no sigificant difference in the mean anthropometric parameters of male and female infants like body weight, head, chest and mid upper arm circumference whereas the length of male infant was significantly ($P<0.05$) higher than that of female infants. When compared with values given by ICMR for Punjabi as well as Indian infants, their anthropometric parameters were found to be similar. On the other hand, the body weight and length of these infants were significantly lower than the NCHS standards ($P<0.01$). The income had a significant ($P<0.05$) effect on all the anthropometric parameters only in case of older infants (9-12 months).

PSP
OC.5

5. BODY FAT DISTRIBUTION IN HIG ADULTS

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The study of fat patterning has been of interest in human biology and medicine. The selection of anthropometric dimensions has been shown to be easier to obtain and more accurate enough to be useful in large scale clinical studies. Relationships among these indices and systematic information on the effect of Age, Sex and BMI have been studied in 30 men (15+15) and 30 women (15+15) aged 39-60 years (i.e. 39-49 and 50-60 years). These are waist hip ratio, arm thigh ratio, waist thigh ratio and waist arm ratio, besides abdominal circumference and chest circumference. Women in 39-40 years showed high ratios (WHR & WAR) compared with women in 50-60 years, whereas men in 50-60 years showed high ratios of AIR, WTR compared with men in 39-40 years. The abdominal circumference (Cms) in men of 50-60 years is very high when compared with men in 39-49 years and also women of two age groups. The BMI Grade of men in 39-60 years varied from less than normal (<0) to grade I, where as BMI grade in women varied from normal to grade II. The data was analysed for data processing and step wise multiple regression. The results will be presented in the paper.

PSP
OC.6

6. ANAEMIA, UNDERNUTRITION AND PRODUCTIVITY

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Haemoglobin levels were determined in 32 tea plantation female workers whose iron status and anthropometric measurements were also determined. Productivity (Kg tea plucked for a month above the minimum per day) of the workers with Hb 8.0 g/dl was significantly higher (138.1 ± 2.28) than the ones with Hb below 8 g/dl (121.9 ± 3.16). When women were classified as good (26 kg/day) or average pluckers (26 kg/day), the Hb difference between the two groups was significant but there was no difference in the anthropometric measurements. Supplements of iron (30 mg or 60/day) improved Hb as well as productivity of the women. Thus in this population anaemia rather than undernutrition was found to be the major determinant of productivity.

PSP
OC.7

7. EXTENSION OF SHELF LIFE OF MATHIAS

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Methia is a Gujarati traditional recipe made especially during festivals. It is a fried snack whose quality deteriorates rapidly due to the oxidative rancidity of fats. Hence, the efficacy of dehydration and gamma irradiation in the extension of the shelf life of Mathias was studied.

The study aimed at determining the effect of dehydration itself and a combined effect of dehydration and irradiation on the shelf life and sensory attributes of Mathias stored at room temperature. Dehydration was carried out at 60 degree centigrade for 1/2 hour. Three different radiation dosages of 250 krads, 500 krads and 750 krads were used. These samples were analysed for a storage period of 4 months for microbial and sensory changes. The results obtained from irradiated samples were compared with unirradiated samples.

The microbial load was estimated to evaluate the safety of the products. A 5 point hedonic rating scale was used to assess attibutes including appearance, colour, aroma, texture, taste etc.

The results obtained showed that dehydration along may not be a method of preserving mathias. But dehydration along with irradiation even at the lowest dosage of 250 krads can appreciably extend the shelf life of Mathias. The

acceptability of irradiated Mathias was also found to be comparable to fresh Mathia.

PSP OC.8

8. LIPID PROFILE AND LIPID PEROXIDES IN DIABETES

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This study examined lipid peroxides and lipid profile in diabetics with and without complications. 117 non insulin dependent diabetics and 34 insulin dependent diabetics were compared to healthy controls.

Elevated lipid values were observed in diabetics compared to healthy controls with the highest values being recorded in diabetics with complications. All the lipid parameters viz., total cholesterol, triglycerides, HDL-cholesterol, LDL-cholesterol and VLDL-cholesterol were significantly influenced by duration of diabetes and glycemic control.

Lipid peroxides evaluated in diabetics as compared to healthy controls, highest values were found in diabetics with complications. Peroxides showed a negaive but significant correlation with HDL-C fraction. Lipid peroxides values were significantly influenced by age of the patient, duration of diabetes, age at onset of diabetes, body mass index and duration of ischemic heart disease.

The results indicate that increased perioxidative stress may be an important risk factor in the development of macro and micro angiopathy.

PSP OC.9

9. INCIDENCE OF IHD AND SIGNIFICANCE OF ASSOCIATION WITH SEX BETWEEN ASSOCIATE DISEASES (HT & DM) IN TIRUPATI

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The present study has been made with the object of collecting data on the incidence of IHD with reference to age, sex and associate diseases such as hypertension and diabetes mellitus. The total number of patients in the Department of Cardiology, S.V.R.R. Hospital, Tirupati during the period of August 1985 to 1991 were 1,949. Out of these the disease was seen in 1,582 men (175.77 $\pm$ 180.77) and 367 women (45.8 $\pm$ 34.9). The male to female ratio was 4:1. It is observed that the percentage incidence of IHD in Males and Females in the age group (i) Below 20 years (ii) 20-29 years (iii) 30-39 years (iv) 40-49 years (v) 50-59 years (vi) 60-69 years (vii) 70-77 years (viii) 80-89 years (ix) 90-99 years are respectively (i) (0.2, 0.3); (ii) (2.1, 6.8); (iii) (9.0, 9.8); (iv) (22.9, 16.3); (v) 31.9, 31.9); (vi) 24.7, 21.3); (vii) (7.1, 7.9); (viii) 1.9, 5.1); (ix) (0.3, 0.5). A total of 380 IHD deaths (19.5%) was recorded. Out of these cases 299 (15.3%) was in males and 81 (4.2%) in Females. 31 IHD deaths (12.7%) with Hypertension and 22 (11.6%) IHD deaths with diabetes mellitus was recorded.

There was a significant effect of sex on IHD with an associated disease ($P<0.05$). Males predominated high risk of IHD with hypertension(62.2%), whereas females showed high risk of IHD with diabetes mellitus (72.8%) as an associate disease.

PSP OC.10

10. CHLAMYDIA TRACHOMATIS INFECTION IN HIGH RISK PREGNANT WOMEN AND ADVERSE PREGNANCY OUTCOME

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Maternal genital infection has long been suspected of influencing the outcome of pregnancy. The classic sexually transmitted diseases are recognised as the cause of congenital infection in the fetus and new born causing high morbidity and mortality. Very little information is available on the prevalence of these infections in high risk pregnant women in relation to outcome. An investigation is undertaken in low income high risk pregnant women to study chlamydia trachomatis infection for prevalence and outcome. The incidence of chlamydia infection as detected by IgM antibodies is 32.3%. Eighty two percent of seropositive group had adverse pregnancy outcome as against 43.8% in the negative group. Mean birth weight of infants in positive group was 2.53 kg. as against 2.72 kg in negative group with incidence of low birth weight (<2.5 kg) 71.5 and 47.4% respectively. The incidence of abortion was twice and still birth rate was 6 times higher in the sero positive group as against control group. The implication of chlamydia trachomatis infection on adverse pregnancy outcome needs indepth studies.

PSP OC.11

11. PSYCHOSOCIAL PROFILE OF ADOLESCENT CHILDREN

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A sample of 255 boys and 223 girls aged 9 to 11 years was followed to study their psychosocial profile, which included intelligence, adjustment and anxiety. Influence of intelligence on the anxiety and adjustment of adolescent children (9-12 years) was measured along with certain social variables, like child's and parent's education and occupation, family pathology etc. It was found that intelligent children had less adjustment problems (32.4±6.02 for boys, 38.0±9.1 for girls), and more number of boys attended school compared to girls (X^2 = 69.30, $P<0.001$). Among the social variables, mother's and child's education had positive influence on the psychosocial profile. No sex differences were found regarding anxiety levels but it was observed that more girls were socially maladjusted compared to boys.

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